TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

Volume 1
Regulatory Volume

CP-35-1

Alyeska pipeline SERVICE COMPANY



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Alyeska pipeline SERVICE COMPANY

Trans Alaska Pipeline Owner/Operator

The Owners of the Trans Alaska Pipeline System (TAPS) are as follows:

- BP Pipelines (Alaska), Inc.
- ExxonMobil Pipeline Company
- ConocoPhillips Transportation Alaska, Inc.
- Unocal Pipeline Company

Alyeska Pipeline Service Company is the operating agent for the Trans Alaska Pipeline System.

Alyeska's corporate headquarters are located at:	**Pipeline Fairbanks headquarters are located at:**
Alyeska Pipeline Service Company	Alyeska Pipeline Service Company
3700 Centerpoint Drive	615 Bidwill Street
Anchorage, Alaska 99503-5827	Fairbanks, Alaska 99701
Phone: (907) 787-8700	Phone: (907) 450-5707

QUALIFIED INDIVIDUALS – PIPELINE PLAN

Persons designated as Qualified Individuals for the *Pipeline Oil Discharge Prevention and Contingency Plan* are as follows:

- Senior Vice President Operations, Anchorage
- Senior Director Pipeline Operations, Fairbanks
- Senior Director Valdez Operations, Valdez
- Manager Terminal/Operations
- Right-of-Way (ROW) Director
- Pipeline Managers or Maintenance Supervisors (MS)
- Fairbanks Duty Officer

These individuals will:

- Speak fluent English
- Be available on a 24-hour basis and be able to arrive at the facility within a reasonable amount of time

- Be familiar with the implementation of the response plan
- Be trained in the responsibilities of the Qualified Individual under the response plan

These individuals will have the authority to:

- Activate and engage in contracting with oil spill removal organizations
- Act as liaison with the predesignated Federal On-Scene Coordinator (FOSC) and the State On-Scene Coordinator (SOSC)
- Obligate funds to carry out response activities

TABLE 1 QUALIFIED INDIVIDUALS - PIPELINE PLAN

Qualified Individuals	Office Ext.
John Baldridge Senior Director Pipeline Operations Alyeska Pipeline Service Company 615 Bidwill Street Fairbanks, AK 99701	907-450-7746 After hours call Fairbanks Duty Officer at 907-460-6092
Lorena Hegdal ROW Director Alyeska Pipeline Service Company 615 Bidwill Street Fairbanks, AK 99701	907-450-5740 After hours call Fairbanks Duty Officer at 907-460-6092
Senior Director Valdez Operations	7300
Senior Vice President Operations	8331
PS01 Maintenance Supervisor	4102/4100
PS04 Maintenance Supervisor	4402/4400
PS05 Response Base Supervisor	4502/4500
PS09 Maintenance Supervisor	4902/4900
GRB Response Base Supervisor	5102
Fairbanks Duty Officer	907-460-6092

Notes:

- *Responsibility for offline pump stations is conveyed to the adjacent station.*
- *Names of individuals assigned as Qualified Individuals are listed in Alyeska's Emergency Telephone Book.*
- *Home phone numbers are listed in Alyeska's Emergency Telephone Book.*

Introduction

PURPOSE AND ORGANIZATION OF PLAN

Alyeska Pipeline Service Company (Alyeska) has prepared the *Pipeline Oil Discharge Prevention and Contingency Plan* (the "Plan") to provide operations and support personnel with information to assist in the prevention of oil discharges and the response to oil discharges should they occur. This Plan was developed with input from various state and federal agencies having oversight of the Trans Alaska Pipeline System (TAPS), facility operators, oil spill response personnel, and the public. The plan will be routinely assessed for improvements in preventing and responding to oil spills. Alyeska is committed to assign the resources necessary for effective, efficient, and aggressive prevention and response to oil spill emergencies.

CONCEPT OF VOLUMES [18 AAC 75.425(d)(2)]

The Plan is arranged in four volumes.

Volume 1: "Regulatory Volume" contains information related to:

- Response Action Plan
- Prevention Plan
- Supplemental Information
- Best Available Technology Review
- Response Planning Standard
- Appendices A through C contain state and federal agency plan format cross references.

Volume 2: "Scenarios Volume" contains Response Strategy Scenarios described in 18 AAC 75.425(e)(1)(F). Each Scenario will reference tactical information in Volume 3, and general response information in Volume 1.

Volume 3: "Tactics Volume" is a compilation of tactics that are organized and designed for operational personnel. The Tactics Volume contains the following;

- Initial Response Actions
- Containment and Recovery tactics
- Containment Site Instruction Tables Section provides detailed response descriptions along the TAPS ROW. To clarify a response, the tables are subdivided as follows:
    - Contingency Areas – that part of a major drainage basin that could be affected by oil spill from the section of the pipeline traversing the drainage basin.
    - Segments – A subdivision of a contingency area, determined by minor drainage features.

- Hydrology Tables
- Containment Site Deployment Maps and Descriptions

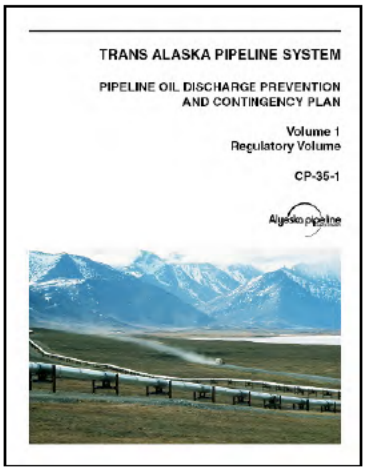
  For each contingency area, detailed information is provided on reconnaissance actions, potential spill volumes, pre-identified containment sites, prestaged equipment, priority control actions, access points, anticipated oil migration routes, and environmentally sensitive areas.

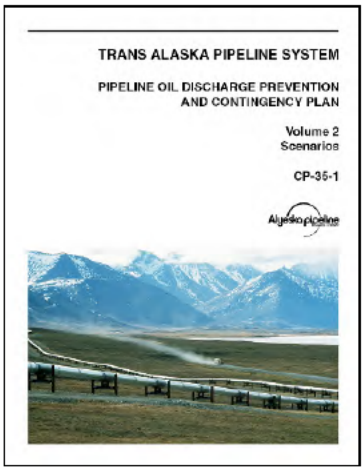
Volume 4: “Map Atlas” contains:

- Topographic (C-Plan) maps
- Aerial maps of TAPS and facilities

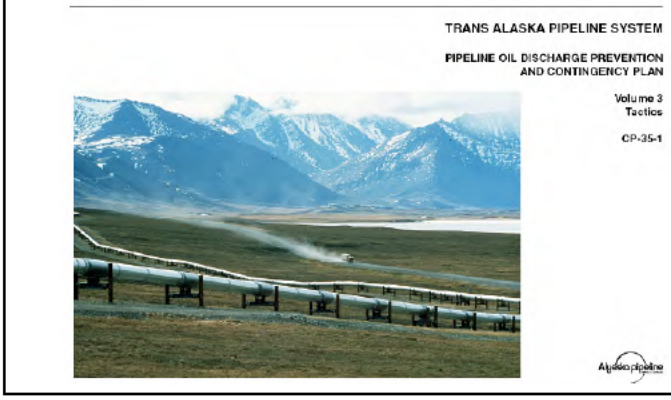
Supplemental Information
Source documents listed in the Bibliography

Volume 1, Regulatory Volume **Volume 2, Scenarios**
Follows ADEC requirements in 18 AAC 75.
Includes information that applies to all scenarios.

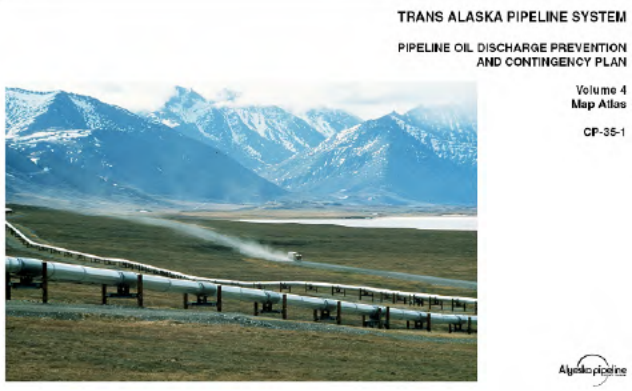




Volume 3, Tactics Manual
Includes tactical information, containment site characterization detail, containment site maps, and hydrology information.



Volume 4, Atlas
Includes topographic (C-Plan) maps and aerial photographs.



Alyeska GIS and G100 Maps



FIGURE 1 ORGANIZATION CHART FOR ALYESKA PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

RELATIONSHIP TO OTHER PLANS

In the event oil spilled from a pipeline source reaches marine waters in Prince William Sound (PWS) or Prudhoe Bay, relevant portions of the PWS Tanker Oil Discharge Prevention and Contingency Plan, the Valdez Marine Terminal Oil Discharge Prevention and Contingency Plan, and the North Slope Alaska Clean Seas Technical Manuals, Volume One, “Tactics Descriptions,” and Volume Two, “Map Atlas” will guide the response.

AREA OF COVERAGE

The Plan covers the main pipeline and related facilities beginning at Pump Station 1 battery limit, or block, (b) (7)(F), (b) (3) (incoming producer pipeline block valves) and ending at the Valdez Marine Terminal property fence line at pipeline (b) (7) (F) (b).

NATIONAL CONTINGENCY PLAN AND AREA CONTINGENCY PLAN(S)

This Plan was prepared in accordance with, and consistent with, the National Contingency Plan, the “Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases,” Vol. 1, July, 1999, and the Sub-Area plan for PWS, Interior Alaska – June 2000, and North Slope – December 1999.

PLAN REVIEW, REVISION, AND MAINTENANCE PROCEDURE

Annual review of the Plan will be coordinated by the Senior Director, Pipeline Operations. Anyone at anytime can submit proposed changes to the Document Owner for review and endorsement. If warranted, the Senior Director, Pipeline Operations will make the application/notification to the regulatory agencies.

Alyeska will revise and distribute the Plan in accordance with state and federal guidelines, and will maintain the Plan in a current and up-to-date condition. Updates will occur for any one or more of the following:

- Annual review.
- Re-submittal.
- Changes to organization, individual/group, or Qualified Individual(s).
- Modification to the pipeline system that adds or reduces facilities.
- Changes to response procedures or personnel.
- Significant lessons learned in drills or actual spill events.
- New or different operating conditions that would cause a significant change to the Plan (pre-notification to agencies and submittal within 30 days).
- Different worst case discharge volume.

- Changes in commodities transported.
- Change in Oil Spill Removal Organization(s).
- Changes to the National Contingency Plan or Area Contingency Plan that have a significant impact on the appropriateness of response equipment or strategies.
- Or other changes to operating conditions that could cause a significant change to the ability to implement this plan.

Alyeska will submit proposed changes to the Alaska Department of Environmental Conservation (ADEC), U.S. Department of Transportation Pipeline and Hazardous Material Safety Administration (PHMSA), the U.S. Environmental Protection Agency (EPA), and the Alaska Joint Pipeline Office (JPO) for review and agreement/approval.

LIABILITY, AUTHORITY, AND RESPONSIBILITY

In accordance with this Plan, Alyeska will conduct cleanup operations for spills resulting from TAPS operations, including spills within the right-of-way or related facilities under the ownership or control of Alyeska or its Owners.

Alyeska will not assume direction of response cleanup operations for oil spills occurring at or from facilities operated by parties not directly involved with TAPS or for spills of unknown origin. However, upon becoming aware of such spill(s), Alyeska will promptly notify the proper government agencies and may enter into containment operations of spill(s) for other parties or to spills of unknown origin if the person or agency responsible:

- Requests assistance in the containment operations
- Guarantees all costs will be paid
- Retains direction of containment operations

Regardless of the spill's source, in accordance with this Plan, Alyeska personnel will make every reasonable effort to prevent oil from entering a stream, an environmentally sensitive area, or a potentially hazardous area when, in the opinion of the supervisor on the scene, such action is necessary to protect public interest.

In the event of a third-party chemical spill, if the chemical is unknown and Alyeska personnel are requested to assist, the Safety Officer (SO) (refer to Volume 1, Section 1.3, "Safety") should be notified in order to contact the Chemical Transportation Emergency Center (CHEMTREC) in Washington, D.C. CHEMTREC provides a 24-hour, collect-call service (202-483-7616 or 800-424-9300) to provide advice for those at the scene of emergencies and to promptly contact the shipper of the chemical involved for more detailed assistance or appropriate follow-up.

PLAN APPROVAL AND COMMITMENT OF RESOURCES

The Plan will be submitted for agency review and approval on the following frequency:

- Alaska Department of Environmental Conservation – every 5 years
- U.S. Department of Transportation (PHMSA) – every 5 years
- U.S. Environmental Protection Agency – every 5 years
- U.S. Bureau of Land Management – annually
- Alaska Department of Natural Resources – annually via Alaska Department of Environmental Conservation.

ALASKA DEPARTMENT of Environmental Conservation

Certificate of Approval for Oil Discharge Prevention and Contingency Plan

Certificate Number: 11CER-036 **Plan Number:** 11-CP-4071

Name of Plan: **Trans-Alaska Pipeline System, Pipeline Oil Discharge Prevention and Contingency Plan**

Name of Facility: **Trans-Alaska Pipeline**

Plan Holder: **Alyeska Pipeline Service Company**

Address: **P.O. Box 196660 Anchorage, Alaska 99519-6660**

Telephone: **(907) 787-5706** **Fax:** **(907) 787-7667**

Region of Operation (18 AAC 75.495): **North Slope, Interior, and Prince William Sound Regions**

Effective Date of Approval: **November 30, 2011** Expiration Date: **November 30, 2016**

This approval is subject to the terms and conditions of the applicable Alaska Department of Environmental Conservation contingency plan approval letter and continuing compliance with the requirements of AS 46.04 and 18 AAC 75.

Betty Schorr 11.30.2011

Betty Schorr, Approving Authority Date
Program Manager, Industry Preparedness Program

PHMSA 00014245

COMMITMENT OF RESOURCES [18 AAC 75.425(c)(3)]

Alyeska management certifies and commits that Alyeska Pipeline Service Company has obtained, directly, or through contract, or other approved means, the oil spill discharge prevention and response personnel and equipment necessary to respond to the maximum extent practicable to a worst case discharge or a substantial threat to such a discharge. Alyeska further commits to carrying out the spill prevention measures described in this Plan.

John Baldridge

John Baldridge
Senior Director, Pipeline Operations

5/29/14

Date

DOCUMENT APPROVAL

Document Number		Document Title
CP-35-1 Volume 1		*Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan*
Edition	**Revision**	**Effective Date**
3	0	December 21, 2011

The owner of this document hereby certifies that this manual has been reviewed and finds that it is in compliance with Alyeska Pipeline Service Company Quality Program requirements.

A document that is approved as written will not result in a revision or edition change.

APPROVED BY:

On file in GLs 19584, 20569, 20614, 20677, and 24796

Wes Willson

Emergency Preparedness and Compliance Manager

Revision History

Approved by: **John Baldridge,** *Senior Director Pipeline Operations*

Document Title	Document Number	
Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan, Regulatory Volume	*CP-35-1 Volume 1*	
Current Revision Features	**Ed. 3, Rev. 11**	**October 8, 2014**

Approval to publish Routine Amendment, Government Letter 31255

Government Letter 31074: Volume 1, Appendix A, EPA Facility Response Plan

Alyeska's internal organization and the associated qualified individual information has been updated in Appendix A.

Approval to publish Routine Amendment

Government Letter 31195: Volume 1, Section 2.1.7.3, Secondary Containment Areas for Tank Truck Offloading Areas

Revised section to clarify that tanker truck secondary containment is sufficient to hold maximum capacity of any tanker compartment.

Revision Features	Ed. 3, Rev. 10	August 28, 2014

Approval to publish Routine Amendment, Government Letter 31069

Government Letter 30375: Minor Miscellaneous Edits

Changes include correcting containment site locations, correcting citations and response contractor for helicopter services.

Government Letter 30871: Exercise Manual Update and References to Procedures

Updates address conditions of approval required for amendment number 4071-11. This approval required:

- Adding citations for *EPC-001, Compiling and Retain Form 10800-x, IRT Personnel Form (series)* and *EPC-002, Fairbanks Response Base Emergency Response Notification* to the plan; and
- Update the content of the plan to reflect the joint management and ownership (post reorganization) of *RES-00148, Oil Spill Response Exercise Program.*

Government Letter 30872: Volume 1, Appendix B, USDOT Facility Response Plan

Updates have been made in response to USDOT PHMSA Government Letter 30038 to include:

- 24-hour contact information for the Qualified Individual; and
- A comparison of the largest breakout tank volume to the calculated pipeline's worst case discharge volume.

Revision Features	Ed. 3, Rev. 9	June 16, 2014

Approval to publish Routine Amendment, Government Letter 30313

Government Letter 30093: APSC Department Reorganization

This revision request reflects changes to APSC's internal organization and the associated qualified individual information cited in the C-Plan.

Approval to publish Routine Amendment, Government Letter 30362

Government Letter N/A: PS01 Inspection Letter

Updates were made to Table 3-7 in response to PS01 inspection with regard to airboat winter storage and miscellaneous minor edits.

Continued on page ii.

Revision Features	Ed. 3, Rev. 9	June 16, 2014

Continued from page i.

Approval to publish Routine Amendment, Government Letter 30391

Government Letter 30144: Response Trailer Amendment

This revision request reflects changes to oil spill response trailers. Each 32-foot trailer has been replaced with both a 26-foot summer and 26-foot winter trailer.

Government Letter 30162: Minor Miscellaneous Amendment

This revision request reflects minor miscellaneous edits throughout the plan.

Revision Features	Ed. 3, Rev. 8	January 30, 2014

Approval to publish Routine Amendment, Government Letter 29629

Government Letter 29284: Response Trailer Amendment

As part of a major multi-year project, APSC has taken the older 32-foot response trailers and created 26-foot summer- and winter-specific response trailers and the 45-foot response trailers have been reconfigured; documentation has been upgraded to more accurately reflect the contents.

Government Letter 29440: Revisions to Containment Site Information

Updates were made to Table 3-21 through Table 3-23 and to Section 3.6.6 following completion of the annual containment site review.

Revision Features	Ed. 3, Rev. 7	August 7, 2013

Approval to publish Routine Amendment, Government Letter 28705

Government Letter 28334: Tank Inspection Update Amendment

Tank inspection dates and information have been updated in Sections 2 and 3. In addition, two minor revisions to correct the RGV 88 listing in Table 3-1, and the asset area assignments for CS 10-4 and 10-5 in Table 3-21 and on page 3-181.

Revision Features	Ed. 3, Rev. 6	July 25, 2013

Approval to publish Routine Amendments, Government Letter 28287

Government Letters 25993 and 28028: Acronyms and Notification Matrix Amendment

Government Letter 28149: Routine Amendment to Appendix A, Environmental Protection Agency Facility Response Plan Cross-Reference (Non-Transporation Related)

Updates were made to oil spill notification information in Table 1-2 and contact information in Table 1-3. In addition, Form 0009, “OCC Spill/Notification Form," has been revised to reflect similar reporting information and is referenced with an updated sample form (Figure 1-1).

The FRP (Appendix A) was approved by the EPA on October 8, 2012.

Various minor updates were made to Sections 2.1.5 and 3.12 and Tables 3-7 and 3-26.

Approval to publish Routine Amendment, Government Letter 28312

Government Letter 26559: Description of Tank 35-TK-157 Alternative Leak Detection and Request for Routine Amendment Approval 35-TK-157 Return to Service

Tank 35-TK-157 has been returned to service, and the tank information is included in the plan.

Revision Features	Ed. 3, Rev. 5	March 20, 2013

Approval to publish Routine Amendment, Government Letter 27676

Government Letter 27045: 2012 Containment Site Amendment

Reorganized the containment site information in Section 3 pursuant to the 2012 containment site amendment.

Revision Features	Ed. 3, Rev. 4	November 8, 2012
Approval to publish Routine Amendment, Government Letter 26753 **Government Letter 26555: Closeout Requirements for Tank 190 Secondary Containment Project** With the completion of the Secondary Containment Project for Tank 190 at Pump Station 9, Figure 1-30 and Section 2.1.7 have been updated to reflect new containment size and layout.		

Revision Features	Ed. 3, Rev. 3	August 17, 2012
Approval to publish Routine Amendment, Government Letter 26203 **Government Letter 25985: Revisions to Vessel Distribution Information** Vessel distribution information has been updated in Section 3, Table 3-7. **Approval to publish Routine Amendment, Government Letter 26202** **Government Letter 25988: Revision to Dispersant and Logistical Support Information** Dispersant and C-130 aircraft references have been removed in Section 3.5.1 and Table 3-28. **Approval to publish Routine Amendment, Government Letter 26202** **Government Letter 25989: Tank Inspection Waiver Amendment** Tank inspection information for Tank 220 has been updated in tables 2-4 and 3-3 to match the terms of the ADEC waiver granted in Government Letter 26024 on May 25, 2012. The waiver is provided in Section 2.6. **Approval to publish Routine Amendment, Government Letter 26203** **Government Letter 25996: Miscellaneous Minor Edits Amendment** Minor edits include updates to Section 3.6.2.2 (update description of “non-circulating hydraulic” equipment), Table 3-7 (correct location information for snow melter), Table 3-12 (update radio information to include new equipment), and Section 1.1.2 (update recon checklists to match checklists in the Field Operations Guide).		

Revision Features	Ed. 3, Rev. 2	May 11, 2012
Approval to publish Routine Amendment, Government Letter 25562 **Government Letter 25247: Revisions to Containment Site Information** Containment site information has been updated in Section 3, Table 3-21 through Table 3-25.		

Revision Features	Ed. 3, Rev. 1	March 8, 2012
Approval to publish Routine Amendment, Government Letter 25240 **Government Letter 25019: Revisions to Containment Site Information** Updates include the consolidation of repetitive information and updated inventory and location information for containment site tables in Section 3.		

Revision Features	Ed. 3, Rev. 0	December 21, 2011
Approval to publish Government Letter 24796. Initial issue of Volume 1, Edition 3, Revision 0.		

Revision Features	Ed. 2, Rev. 3	December 13, 2010

Amendment Request GL 22052

Tankage has changed at Pump Stations 3, 4, 7, and 9, resulting in updates to the following:

- Sections 2.1.5, Transfer Procedures, and 2.1.6.3, Leak Detection System
- Tables 2.1 through 2.3, Tables 2.5 and 2.6, Tables 2.16 and 2.17, and 2.22
- Tables 3.3, 3.4, and 3.9
- Section 3.12, Bibliography
- Section 4.7.1, Prevention and Control Systems for Existing Tanks
- Section 5, Response Planning Standard, “Determining RPS for Pump Stations” subsection

Current Revision Features	Ed. 2, Rev. 2	December 8, 2010

Amendment Request GL 22051

Appendix A, EPA Facility Response Plan Cross-Reference: Pump Station 9 has been removed from Appendix A because it no longer meets the 1 million-gallon storage criteria for jurisdiction under 40 CFR 112.20, Facility Response Plans.

Amendment Request GL 20679

Section 1.1.2: Updates clarify that the Reconnaissance Team will fill out form ICS 201-5, “Site Safety and Control Analysis,” only if trained to do so; this is consistent with the Field Operations Guide (FOG).

Section 3.9.8 and Table 3-36: Training requirements for Initial Incident Commander, and the positions that may be called to fill that role, have been added. HAZWOPER Level 5 and OSCP 24 training have been added to the lead tech learning plan.

Section 3.9.8: Training requirements are included for Staging Area Managers.

Current Revision Features	Ed. 2, Rev. 1	November 17, 2010

Approval to publish Government Letter 20689: Piping Amendment

Amendment Request GL 19584

Approved Amendment Request GL 19584 updates were not incorporated in their entirety in the Ed. 3, Rev. 0, December 21, 2011 publication. The omitted, approved amendments have been incorporated as follows:

Section 2: Regulatory citation updates in section headings and associated text throughout Section 2, including updates to piping descriptions in response to regulatory changes.

Section 4: Regulatory citation updates in section headings and text including sections 4.8.1, 4.9, 4.9.1, 4.10.1, and 4.11.1.

Revision Features	Ed. 2, Rev. 0	April 30, 2010

Approval to publish Government Letter 20689: Piping Amendment

Government Letter 20780: Fairbanks Extended Urban Training Amendment

Government Letter 20809: Skimmer Amendment

Amendment Request GL 19584 and 20569

Introduction: Updated to reflect Volume 1 format update to include new Section 5 for RPS calculations, and clarification for Commitment of Resources is provided.

Section 2.1.1: Updated text to include reference to API 653 standard and include description and oil movement training requirements for Inspection Personnel.

Section 2.1.2: Updated DOT Pipeline Safety Standards reference.

Section 2.1.5: Updated list of procedures.

Section 3.2.2: Updated reference to RPS calculations in new Section 5.

Section 5: New section; previously contained in the Introduction section.

Appendices B and C: Updated references to Section 5, RPS calculations.

Amendment Request GL 20614

Table 1-7: Updated to include Fairbanks Extended Urban team in table footnotes for “other responders” in the Fairbanks area.

Section 2.1.1: Updated to include Fairbanks Extended Urban Team to list of key pipeline positions.

Table 3-36: Updated OSCP Training Matrix to include Fairbanks Extended Urban Team.

Amendment Request GL 20677

Tables 3.16, 3.18, and 3.23: Updated to include Elastec TDS-118G skimmers.

Revision Features	Ed. 1, Rev. 12	March 2, 2010

Approval to publish Government Letter 20401: Houston PRAC Amendment

Government Letter 20167: PS04 Airboat Amendment

Amendment Requests GL 16586 and 20117

Section 1.5.1: Updated PRAC information.

Section 1.5.3: Updated PRAC information.

Table 3-14: Updated Alyeska Contractor information.

Table 3-15: Updated vessel information.

Section 3.8.1.4: Updated PRAC information.

Section 3.8.1.5: Updated PRAC information.

Figure 3-10: Updated PRAC information.

Table 3-35: Updated PRAC information.

Section 3.9.1: Corrected cross reference.

Revision Features	Ed. 1, Rev. 11	December 23, 2009

Approval to publish Government Letter 19827: Hazwoper Training Requirement Amendment.

Amendment Request GL 18185

Section 3.9.1: Updating HAZWOPER training information

Revision Features	Ed. 1, Rev. 10	November 16, 2009
Approval to publish Government Letter 19793: Fire Truck Amendment. **Amendment Request GL 19462** Table 3-15: Revised number of fire trucks required.		

Revision Features	Ed. 1, Rev. 9	November 6, 2009
Approval to publish Government Letter 19756: Ahtna Responder Revision Amendment. **Amendment Request GL 18184** Section 3.8.1.2: Corrected responder requirements.		

Revision Features	Ed. 1, Rev. 8	June 16, 2009
Approval to publish Government Letter 18459 (Emergency Telephone Book Amendment) and Government Letter 18460 (SCADA Tech Amendment) **Amendment Requests GL 17933 and 18183** Table 1-2: Updated paragraph after table to reflect quarterly reporting requirement. Table 3-36: Removed SCADA category. Section 3.9.9: Removed SCADA from OSCP/04 requirements.		

Revision Features	Ed. 1, Rev. 7	October 23, 2008
Approval to publish Government Letter 17106: PS03 Post SR Amendment. **Amendment Request GL 13473** Table 1-1: Removed PS03 contact information. Section 1.5.1: Revised IRT operating areas to reflect removal of PS03 teams. Table 1-8: Removed interim staffing information. Section 2.1.7.1: Added secondary inspection requirements per condition of approval of plan. Table 2-7: Removed PS03 information. Table 2-7a: Added Weekly Inspection Table. Section 2.1.8.4: Removed PS03 information. Table 2-16: Updated tank status information. Section 2.7.3: Updated helicopter information. Table 3-3: Revised tank information for PS03. Section 3.1.6: Updated Mainline Pressure Relief information. Section 3.8.1.5: Removed PS03 information. Section 4.7.1.2: Updated tank status information.		

Revision Features	Ed. 1, Rev. 6	September 3, 2008
Approval to publish Government Letter 15344. Table 3-1: Pipeline Valve Locations table updated to remove PS02 valves.		

Revision Features	Ed. 1, Rev. 5	April 22, 2008
Approval to publish Government Letters 15345, 15567, and 15680. Routine amendment to the following sections: Table 3-23: Updated 32' Trailer table (GL 15567) Table 3-33: Updated CS 2-7 inventory (Gl 15680) Table 3-36: Updated OSCP 22 and 23 requirements (GL 15345) Section 3.9.9: Updated course frequency for OSCP 22 (GL 15345)		

Revision Features	Ed. 1, Rev. 4	December 18, 2007
Approval to publish Government Letter 14156. Routine amendments to the following section: Table 3-15: Updated fire truck/fire foam information. (GL 13179)		

Revision Features	Ed. 1, Rev. 3	September 8, 2007
Approval to publish Government Letter 13170 and 13268. Routine amendments to the following section: Table 3-15: Updated helicopter location information. (GL 13268)		

Revision Features	Ed. 1, Rev. 2	September 7, 2007
Approval to publish Government Letter 13170 and 13268. Routine amendments to the following sections: Table 1: Updated phone number. (GL 13268) Sections 1.4.1 and 1.4.2: Updated communications information. (GL 13170 and 13268) Section 1.5.1: Edited and rearranged helicopter narrative and added 407 helicopter info. (GL 13268) Table 1-7: Updated footnote. (GL 13170) Section 1.5.2.2: Edited and rearranged helicopter narrative and added 407 helicopter info. (GL 13268) Section 1.6.2.1: Updated EC-71-YRB reference. (GL 13268) Section 2.1.5: Updated footnote to transfer procedure requirements. (GL 13268) Table 2-3: Updated average usage for out-of-service 35-TK-157 to NA. (GL 13170) Section 3.6.3: Clarified storage location verbiage. (GL 13170) Section 3.6.5: Updated Fleet Focus information. (GL 13170) Table 3-15: Updated helicopter fuel tank information and helicopter location information. (GL 13268) Tables 3.29 and 3.30: Updated Arco Bridge information to Endicott Bridge. (Gl 13170) Table 3-36: Corrected Hazwoper training requirements. (GL 13170) Section 3.12: Updated EC-71-YRB reference. (GL 13268) Table 4-17: Updated age and condition information. (GL 13268)		

Revision Features	Ed. 1, Rev. 1	July 19, 2007
Approval to publish Government Letter 12734 and 12735. Routine amendments to the following sections: Section 3.6.5: Clarified conex inventory, inspection, and function check schedule. (GL 11742) Table 3-15: Revised 24- and 45-foot trailer information for PS02 and SERVS. (GL 12352)		

Revision Features	Ed. 1, Rev. 0	January 30, 2007
Approval to publish Government Letter 10683. Initial issue of this manual. This manual replaces *CP-35-1 GP, CP-35-1 Region 1, CP-35-1 Region 2, CP-35-1 Region 3, CP-35-1 Region 4*, and *CP-35-1 Region 5*.		

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Appendices

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Appendix B U.S. Department of Transportation Facility Response Plan (Transportation Related) B-1

Appendix C Alaska Department of Environmental Conservation Oil Discharge Prevention and Contingency Plan Cross Reference C-1

List of Acronyms

ACS	Alaska Clean Seas
ADEC	Alaska Department of Environmental Conservation
ADEC IPP	Alaska Department of Environmental Conservation, Industry Preparedness Program
ADEC PERP	Alaska Department of Environmental Conservation, Prevention and Emergency Response Program
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AFE	Authorization for Expenditure
API	American Petroleum Institute
ARFF	Airfield Rescue & Fire Fighting
ARRT	Alaska Regional Response Team
ARTS	Alyeska Radio-Telephone System
BAT	Best Available Technology
BL	Battery Limit
BLM	Bureau of Land Management
BSC	Backbone Satellite Communication
BWT	Ballast Water Treatment
C-Plan or ODPCP	*CP-35-1, Trans Alaska Pipeline System Oil Discharge Prevention and Contingency Plan*
CKV	Check Valve
CMP	Corrugated Metal Pipe
CP	Cathodic Protection
CPE	Chlorinated Polyethylene
CRO	Control Room Operator
CS	Containment Site
DOT	Department of Transportation
DOTPF	Department of Transportation and Public Facilities

DOP	Department Operating Procedure
DRA	Drag Reducing Agent
DTMF	Dual-Tone Modulated Frequency
EC	Environmental Coordinator
EPA	Environmental Protection Agency
EOC	Emergency Operations Center
ESD	Emergency Shutdown
FAA	Federal Aviation Administration
FBE	Fusion Bonded/Epoxy Coating Process
FEOC	Fairbanks Emergency Operations Center
FOSC	Federal On-Scene Coordinator
GWT	Groundwater Table
HAZWOPER	Hazardous Waste Operation and Emergency Response
HCA	High Consequence Areas
IAP	Incident Action Plan
IBRRC	International Bird Rescue Research Center
ICP	Incident Command Post
ICS	Incident Command System
IDLH	Immediately Dangerous to Life and Health
IMO	International Maritime Organization
IMT	Incident Management Team
IPEL	International Pipeline Engineering Ltd.
IRT	Initial Response Team
ISB	In-Situ Burning
JPO	Joint (Federal/State) Pipeline Office
LEFM	Leading Edge Flow Meter
LEL	Lower Explosive Limit
LVB	Line Volume Balance
LWC	Low Water Crossing
MGV	Manual Gate Valve
MOC	Management of Change
MS	Maintenance Supervisor

NED	National Elevation Datasets
NHD	National Hydrographic Dataset
NIDA	National Institute of Drug Abuse
NIOSH	National Institute for Occupational Safety and Health
NOTAM	Notice to Airmen
NPDES	National Pollutant Discharge Elimination System
NPREP	National Preparedness for Response Exercise Program
NRC	National Response Center
OC	Oil Spill Response Coordinator
OCC	Operations Control Center
ODPCP or C-Plan	Oil Discharge Prevention and Contingency Plan
OMT	Oil Movements Team
OSCP	Oil Spill Contingency Plan
OSHA	Occupational Safety and Health Administration
OSRO	Oil Spill Response Organization
P&CM	Pipeline Civil and Maintenance Coordinator
PAH	Polyaromatic Hydrocarbons
PCR	Plan Change Request
PEL	Permissible Exposure Levels
PHMSA	Pipeline and Hazardous Material Safety Administration
PIC	Pressure Indicating Controller
PIO	Public Information Officer
PLMP	Pipeline Milepost
PLQ	Personnel Living Quarters
PM	Preventive Maintenance (Procedure)
PPE	Personal Protective Equipment
PRAC	Primary Response Action Contractor
PS	Pump Station
RBS	Response Base Supervisor
RCRA	Resource Conservation and Recovery Act

RGV	Remote Gate Valve
RN	Registered Nurse
RMOL	Realistic Maximum Operating Limitations
ROW	Right-of-Way
ROWMIS	Right-of-Way Maintenance Information System
RPS	Response Planning Standard
RCRA	Resource Conservation and Recovery Act
SCADA	Supervisory Control and Data Acquisition
SCAT	Shoreline Cleanup Assessment Technology
SCBA	Self-Contained Breathing Apparatus
SDS	Safety Data Sheet
SEC	Soil Erosion Code
SME	Subject Matter Expert
SOP	Safe Operating Procedure
SOSC	State On-Scene Coordinator
SPCC	Spill Prevention Control and Countermeasures
SPOC	Single Point of Contact
SR	Strategic Reconfiguration
SRA	Screening Risk Assessment
TAPS	Trans Alaska Pipeline System
TCLP	Toxicity Characteristic Leeching Procedure
TLV	Threshold Limit Value
TVB	Transient Volume Balance
TWA	Time Weighted Average
USFWS	United States Fish and Wildlife Service
USCG	United States Coast Guard
USGS	United States Geological Survey
UT	Ultrasonic Testing
VEOC	Valdez Emergency Operations Center
VHF	Very High Frequency
VMT	Valdez Marine Terminal

Section 1. Response Action Plan [18 AAC 75.425(e)(1)]

1.1 EMERGENCY ACTION CHECKLIST [18 AAC 75.425(e)(1)(A)]

1.1.1 Assessment

The person reporting an oil spill to the Operations Control Center (OCC) is required to supply minimum spill assessment information to provide as complete an understanding of the incident as possible. Information will include:

- Any injuries
- Type of spill
- Exact spill location
- Location of roads, rivers, trails for access
- Estimated spill volume (clearly identify that you are reporting an initial estimate of the volume only)
- Cause of spill
- Estimated area covered
- Estimated release rate, if continuing
- Direction of oil movement
- Description of area contaminated
- Proximity of spill to sensitive areas
- Location of access roads, trails, or rivers
- Response equipment required
- Equipment, vehicles, tanks involved
- Weather/wind conditions at scene

The “OCC Spill/Emergency Report Data Sheet” (Form 0009; Figure 1-1) is an electronic form available in the TAPS Document System that provides prompts for the OCC Controller and contains key phone numbers for making and documenting notifications. Field employees are provided with an “Oil Spill Wallet Card,” (Form 9143; Figure 1-2) to assist them in the initial reporting process.

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OCC Spill/Notification Form

It is Not Necessary to Wait for All Information Before Calling or Submitting the Spill Report Form. If Information is Unknown, Leave Blank. REPORT IMMEDIATELY IF IN DOUBT, OR IF SPILL HAS POTENTIAL TO EXCEED THRESHOLDS.

Reported to OCC By: Name:
Company:
Position:
Address:

Time Reported:

Phone Number of Reporter:

Date of Discovery:

Time of Discovery:

Report Type:
☐ Initial Notification ☐ Amendment

Category (if known):
☐ APSC ☐ Contractor ☐ 3rd Party ☐ Historical ☐ Drill

Substance Spilled/Leaked:

☐ Crude	☐ Diesel Fuel	☐ Halon	☐ Freon	☐ Propane	☐ Natural Gas
☐ Lube Oil	☐ Oily Water	☐ Turbine Fuel	☐ Hydraulic Fluid	☐ Motor Oil	☐ Gasoline
☐ Antifreeze	☐ Therminol	☐ Trans Fluid	☐ JP-4 (JetB)	☐ AVGAS	☐ DRA
		☐ Ballast Water	☐ Brine	☐ Mercury	Other _____

Quantity to Water: _____	Measurement:			
	☐ Teaspoons	☐ Tablespoons	☐ Ounces	☐ Cups
	☐ Pints	☐ Quarts	☐ Gallons	☐ Barrels
Quantity to Land: (uncontained) _____	Measurement:			
	☐ Teaspoons	☐ Tablespoons	☐ Ounces	☐ Cups
	☐ Pints	☐ Quarts	☐ Gallons	☐ Barrels
Quantity to Containment: _____	Measurement:			
	☐ Teaspoons	☐ Tablespoons	☐ Ounces	☐ Cups
	☐ Pints	☐ Quarts	☐ Gallons	☐ Barrels
Quantity: (If Dry) _____	Measurement:			
	☐ Ounces	☐ Pounds		

General Location:
☐ Pipeline ☐ Terminal ☐ SERVS ☐ PWS ☐ Other ☐ Land ☐ Water ☐ Land & Water ☐ Air

Specific Location: (Specific site within facility, ROW, water body, public area, city,etc.)

Lat/Long: (if known)

Mile Post: (Pipeline, Road, River)

Area Affected: (Sq. Ft.)

Specific Type of Area Affected: (Snow, Ground, Gravel Pad, Asphalt, Tundra, etc.)

Source: (Vessel name if involved, equipment type, tank, valve, Tag Number, etc.)

Cause: (Get Specific Details if available)

Immediate Action Taken:

Spill Site Supervisor: (Name, APSC or Contractor)

Remarks:

SECTIONS BELOW MUST BE FILLED OUT FOR NRC REPORTING; USE AS NEEDED FOR OTHER SPILLS.

Weather Conditions
☐ Clear ☐ Snowing ☐ Freezing Rain ☐ Raining ☐ Cloudy

Wind Direction:_____ Wind Velocity:_____ Ambient Temp:_____

Has Responsible Party been contacted? Yes ☐ No ☐ Unknown ☐
Suspected Responsible Party:
Company:
Position:
Phone Number(s):
Address:

If Caused by Equipment: Owner's Name:

Operator's Name:

Storage Tank Container Type:
Above Ground ☐ Below Ground ☐ Unknown ☐

Tank Capacity:

Is Tank In Containment?
Yes ☐ No ☐

Other Impacts:
Were there Injuries? Yes ☐ No ☐ Unknown ☐ Number of Injuries: ____ Were there Evacuations? Yes ☐ No ☐ Unknown ☐ Number Evacuated: ____
Were there Fatalities? Yes ☐ No ☐ Unknown ☐ Number of Fatalities: ____ Was there any Damage? Yes ☐ No ☐ Unknown ☐ Estimated $ of damage: ____

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FIGURE 1-1 OCC SPILL/EMERGENCY REPORT DATA SHEET (FORM 0009) (PART 1 OF 2)

Alyeska pipeline

OCC Spill/Notification Form

It is Not Necessary to Wait for All Information Before Calling or Submitting the Spill Report Form. If Information is Unknown, Leave Blank. REPORT IMMEDIATELY IF IN DOUBT, OR IF SPILL HAS POTENTIAL TO EXCEED THRESHOLDS.

Notifications	Terminal Plan/PWS Plan Name / Time / Date	Or	Pipeline Plan Name / Time / Date Date
ADEC FBX – 451-2121 (MP 673 & North, including 23-APL-1A) ANC – 269-3063 (South of MP 673 to VMT) Non-Bus Hrs (FBX & ANC):1-800-478-9300			
NRC 1-800-424-8802 Alt: Fax 202-267-1322 or www.nrc.uscg.mil/			
USCG (To water or potential to migrate to water at VMT, SERVS, or S of TPass Only) ANC- 428-4100 Press 0 After Hours			
SERVS Duty Officer x6901			
Terminal Duty Manager Wk Day 834-7300 (VMT Director) Nights and Weekends see OCC Duty Roster			[redacted]
PL Duty Manager – * Normal Business Hours (0730-1700 M-F): PL Director 450-7746 After normal business hours: Duty cell (b) (6) * Note: If spill has the potential to escalate and may require ICS activation, verbal contact is required	[redacted]		
Valdez PD 835-4560			[redacted]
Corporate Comm. Director, Michelle Egan Office 787-8397 Cellular (b) (6)			
[1] **If an IMT Response is activated, notify <u>all</u> the contacts below:** BLM -Mike Wrabetz 271-1355 (w), 344-4004 (h) ADNR- David de Gruyter 269-6899 (w), 891-6566 (c) ADEC IPP - Jennifer Lindberg 269-6494 (w) 602-3991 (c)			
Environmental Emergency/SME Shifflett Cell - 748-8995			
[3] Compliance Director , Tom Stokes Office 787 -8422, Cell (b)			
RCAC (Spills to Land or water at VMT or SERVS, or to PWS. Also report if a spill is S of Thompson Pass with potential to migrate to Port Valdez.) E-mail to DL, RCAC Spill Report			[redacted]
Other			

Controller Name and Signature:	Date:	Time:

Notes:
1. **If unable to reach the listed contact, see OCC Spill Matrix for the alternate contacts.**
2. EPA Notification is accomplished by Notification to the NRC.
3. The Compliance Director is to be called for a release of crude oil of 5 gallons or more that was caused by a pipeline failure OR any size release from a crude or gas pipeline failure that resulted in 1) Death or hospitalization, or 2) Unintentional fire or explosion, or 3) Damage or loss> $50,000.
4. Contents of the Initial Written Spill Notification consist of the best currently known information. Additional spill information will be reported in accordance with 18 AAC 75.300 following further investigation.

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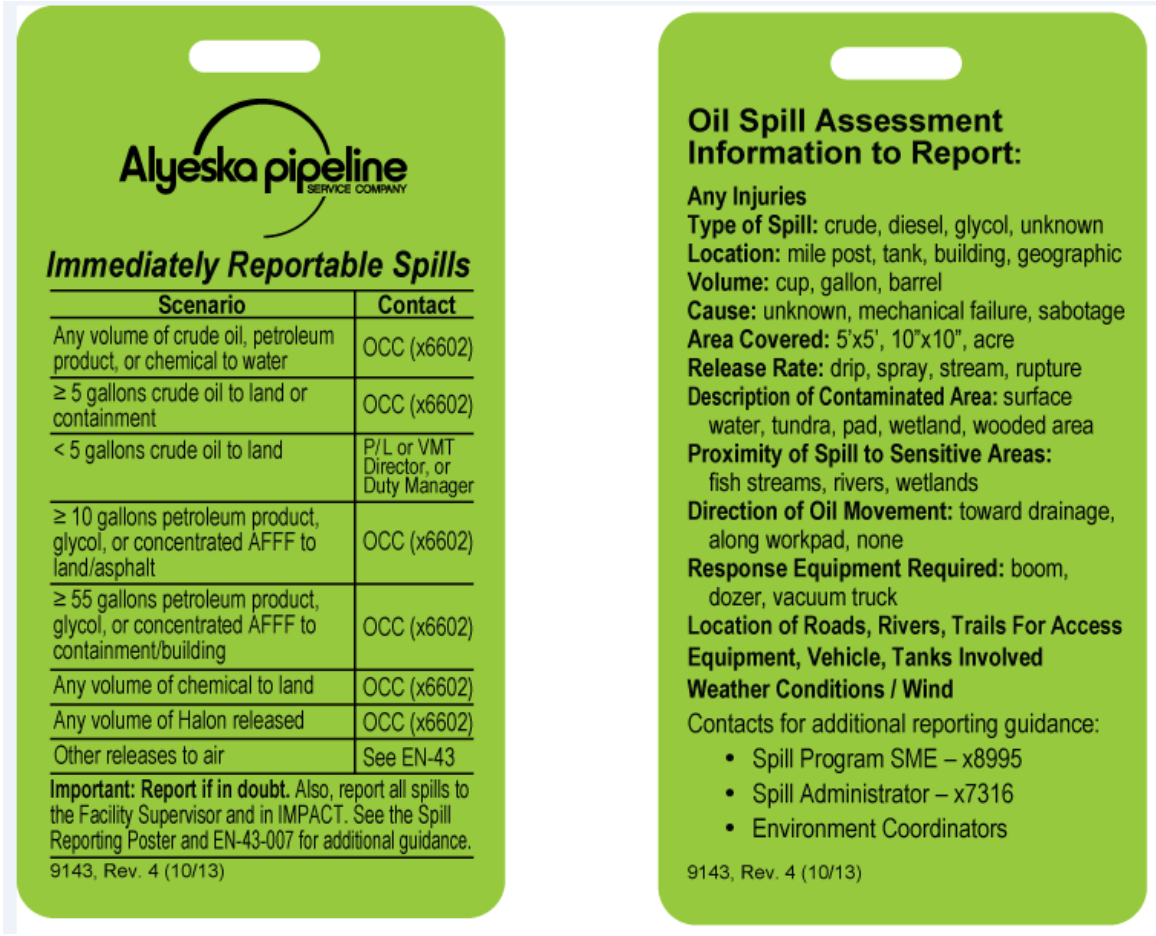
FIGURE 1-1 OCC SPILL/EMERGENCY REPORT DATA SHEET (FORM 0009) (PART 2 OF 2)



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Immediately Reportable Spills

Scenario	Contact
Any volume of crude oil, petroleum product, or chemical to water	OCC (x6602)
≥ 5 gallons crude oil to land or containment	OCC (x6602)
< 5 gallons crude oil to land	P/L or VMT Director, or Duty Manager
≥ 10 gallons petroleum product, glycol, or concentrated AFFF to land/asphalt	OCC (x6602)
≥ 55 gallons petroleum product, glycol, or concentrated AFFF to containment/building	OCC (x6602)
Any volume of chemical to land	OCC (x6602)
Any volume of Halon released	OCC (x6602)
Other releases to air	See EN-43

Important: Report if in doubt. Also, report all spills to the Facility Supervisor and in IMPACT. See the Spill Reporting Poster and EN-43-007 for additional guidance.

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Oil Spill Assessment Information to Report:

Any Injuries
Type of Spill: crude, diesel, glycol, unknown
Location: mile post, tank, building, geographic
Volume: cup, gallon, barrel
Cause: unknown, mechanical failure, sabotage
Area Covered: 5'x5', 10"x10", acre
Release Rate: drip, spray, stream, rupture
Description of Contaminated Area: surface water, tundra, pad, wetland, wooded area
Proximity of Spill to Sensitive Areas: fish streams, rivers, wetlands
Direction of Oil Movement: toward drainage, along workpad, none
Response Equipment Required: boom, dozer, vacuum truck
Location of Roads, Rivers, Trails For Access
Equipment, Vehicle, Tanks Involved
Weather Conditions / Wind

Contacts for additional reporting guidance:

- Spill Program SME – x8995
- Spill Administrator – x7316
- Environment Coordinators

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FIGURE 1-2 OIL SPILL WALLET CARD

1.1.2 Pipeline Reconnaissance – Finding/Verification of a Spill

The reconnaissance (recon) actions described here and in Volume 3, Section 2 are initiated in response to an online leak detection system alarm, a second party report, or some other unusual event that has the potential to initiate an oil spill. A pipeline recon is separate from normal pipeline surveillance and monitoring activities.

Developed pipeline recon teams and instructions are found in Volume 3, Section 2. Recon team staffing is predesignated for each online pump station, the Yukon Response Base, the Glennallen Response Base, and the Valdez Terminal team.

The pipeline online leak detection system, “Transient Volume Balance System” (TVB) has the ability to detect leaks on a pipeline segment basis. This capability allows the pipeline OCC to designate areas north or south of the pump station as the source of the leak. Given this capability, recon teams will normally only be dispatched one direction from their originating point when a ground based recon is required.

When notified of a possible leak, the Supervisor will initiate a recon of the affected pipeline segment. At active pump stations, the Supervisor is the Maintenance Supervisor (MS) or Oil Spill Response Coordinator (OC) or their designee, such as lead technician. At response bases, the Supervisor is the Response Base Supervisor (RBS) or OC or their designee, such as the Baseline Superintendent. Aerial recon is the preferred method when weather conditions or visibility allows. Ground-based recon is the next available technology.

If no leak is discovered during the recon, the following tasks will be completed:

- The online leak detection systems will be monitored and compared.
- The segment recon team may be directed to re-cover the area at slower speeds and more closely investigate areas downstream of pipeline crossings and investigate buried valve vaults by using a flashlight. If necessary, vault entry will be conducted according to appropriate confined space entry procedures to ensure safety of personnel.
- If the situation persists and there are no indications of alarm system error, the pipeline will be shut down, and the suspect segment isolated and tested to confirm that a leak condition does not exist.

Pipeline Reconnaissance Supervisor Checklist

This position is filled by the Operations and Maintenance Supervisor (O&MS), MS, RBS, OC, or designee.

Section:

✓	**Check Off All Completed Tasks**	
	Initiate Reconnaissance Team	Time:
	Notify Pipeline Manager	Time:
	Notify Reconnaissance Coordinator that reconnaissance is required.	
	Brief Reconnaissance Team members of Safety Buddies, if available, on area block points, landmarks, and other appropriate area information. Verify that the safety buddy is comfortable performing the assigned tasks.	
	Verify that each Reconnaissance Team has a TL-1 key in their possession or will obtain one from local Security before leaving the station.	
	Track Reconnaissance Teams' progress (to be reported every half hour).	
	a. Initial Reconnaissance Team Report	
	b. Equipment Availability Report	
	c. Recon Status Report (on the hour and half hour)	
	d. Spill Report	
	Keep Reconnaissance Coordinator informed of Reconnaissance Teams' status and locations.	
	Complete reconnaissance of area in question. If no spill or leak is found, end reconnaissance.	
	Advise OCC that no spill or leak was found.	
If a spill or leak is detected:		
	If sabotage is suspected, notify Security immediately and clear crews away from the immediate area. Preserve the crime scene.	
	Notify OCC once spill is detected. Provide location, volume, area, cause, etc., per "Initial Site Assessment" (Form ICS 201-7).	Time:
	Pass information to Reconnaissance Coordinator to mobilize equipment and personnel.	
	Pass on response activities information from the pump station to the Fairbanks Emergency Operations Center (FEOC).	
	Activate ICS to required level.	
	Assume role of the Initial Incident Commander.	
	Prepare and maintain "Unit Log" (Form ICS 214) throughout the response.	
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.	Time:

Pipeline Reconnaissance Coordinator Checklist

This position is filled by the RBS, the P&CM, or the OC, or their designee.

Section:

✓	**Check Off All Completed Tasks**	
	Receive status every half hour from the Reconnaissance Supervisor.	
	Notify Response Team of the reconnaissance activity and to stand by in the event a spill or leak is detected.	Time:
	Update equipment and personnel lists on computer.	
	Instruct Response Team on what equipment to prepare for a potential spill response.	
If a spill or leak is detected:		
	Check in with the Initial Incident Command Post (ICP).	
	Assume role of the Operations Section Chief.	
	Deploy equipment and personnel to site of the incident per response plan and incident objectives.	Time:
	Prepare and maintain “Unit Log” (Form ICS 214) throughout the response.	
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.	Time:

Pipeline Reconnaissance Team Checklist

Section(s) of Pipeline to be Reconnoitered

(1) MP _____ to MP _____

(2) MP _____ to MP _____

(3) MP _____ to MP _____

Section:

✓	**Check Off All Completed Tasks**	
	Receive assignment from the Reconnaissance Supervisor.	Time:
	Prepare vehicle for mobilization by checking fuel, etc.	
	Load the reconnaissance box, reconnaissance kit, arctic gear (if appropriate), hazardous material gear, and handheld OSCP radio.	
	Load gas detector(s).	
	Pick up food and water if appropriate.	
	Complete a radio check.	
	Assess the need for an “Oversize Load” Permit.	
	Radio in as Reconnaissance Team leaves station and report status to Reconnaissance Supervisor every half hour.	
	In avalanche areas, ensure Avalanche Safety Procedures are followed, and an Avalanche Rescue Kit and backup rescue team are available.	
	If no spill or leak is found, advise Reconnaissance Supervisor and return to base of operations.	
If a spill or leak is detected:		
	Prepare “Recon Tactical Assessment,” Form ICS 201-7.	
	Contact the Reconnaissance Supervisor and transmit “Recon Tactical Assessment” form information.	Time:
	Secure the area as required to control access to the spill site.	
	Take whatever actions are necessary to prevent potential oil migration within the cold zone only (see Volume 1, Section 1.3.5, for a definition of the Cold zone).	
	NOTE: No response can occur in the incident area (Hot or Warm zones) until a “Site Safety and Control Analysis,” Form ICS 201-5 is completed.	
	If trained to do so, conduct a site characterization using the “Site Safety and Control Analysis,” Form ICS 201-5. If not trained, secure area and back away.	
	Upon completion of the “Site Safety and Control Analysis,” and if safe to do so, initiate response options in Hot and Warm zones.	
	Brief arriving response personnel of known site characteristics and hazards.	
	Remain on site until directed to do otherwise by the Reconnaissance Supervisor.	
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.	Time:

Pipeline Reconnaissance OCC Checklist

Section:	

✓	**Check Off All Completed Tasks**
If OCC suspects a leak in a segment of the pipeline:	
	If the suspected leakage rate is small and time permits, check the following:
	a. Flow rate
	b. RPM of pump drivers
	c. Spotty crude oil
	d. Air if recent tie-ins have been made on the system
	e. Pump efficiency if both pressure and flow decrease
	f. Instrument failure
	a) Both upstream and downstream station flow and pressure condition for comparable effect
	g. Open discharge relief valves
	h. Location of scrapers in the pipeline
	If leakage rate cannot be accounted for, contact the pump stations on either side of the suspect segment and request initiation of a reconnaissance.
	Notify the Lead Controller.
	Notify the Pipeline Manager or Duty Officer (during non-duty hours).
	Prepare and send “Event Notification” (Form 2124) per *DO-14-2, Trans-Alaska Pipeline System Controller Operating Manual.*

1.1.3 Pipeline/Facility – Spill Discovered/Initial Response Checklists

The following position checklists are provided to guide personnel in the actions needed to initiate the response to a spill on the pipeline, a pipeline facility, or a pump station.

Pipeline/Facility – Spill Discovered Technician or Person Discovering the Spill Checklist

Section:	

✓	**Check Off All Completed Tasks**	
	Once an oil spill has been discovered, determine size, volume, area covered, cause, and all pertinent data that can be passed on to OCC.	Time:
	Take any actions to mitigate oil spill, such as shutting off fuel/oil valves, initiating emergency shutdown (ESD) button, etc. If the source cannot be isolated safely, egress at once to a safe area.	
	Notify OCC immediately in accordance with the “Preferred Means of Reporting Emergencies” as outlined in the site-specific *EC-71, Emergency Contingency Action Plan*, for your location. Maintain contact with the OCC and provide follow-up information as requested.	Time:

Pipeline/Facility – Spill Discovered RBS, Operations and Maintenance Supervisor (O&MS), or MS Checklist

Section:	

✓	**Check Off All Completed Tasks**	
	Receive notification of a spill.	Time:
	If appropriate, notify OCC. Provide location (in/out of contained area), estimated volume spilled, area covered, cause, and any other information from the “Initial Site Assessment” (Form ICS 201-7).	Time:
	Notify P&CM or OC to initiate response action.	Time:
	If sabotage is suspected, notify Security immediately and clear crews away from the immediate area.	
	Pass on response activities information from the pump station to the FEOC.	
	Activate Incident Command System (ICS) to required level.	
	Assume role of the Incident Commander.	
	Prepare and transmit the “Initial Incident Briefing, Initial Incident Organization” package (Form ICS 201-3M) to the Pipeline Manager or Duty Officer (during non-duty hours).	
	Prepare and maintain Form ICS 214, “Unit Log,” throughout the response.	
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.	Time:

Pipeline/Facility – Spill Discovered P&CM and OC Checklist

Section:	

✓	**Check Off All Completed Tasks**	
	Receive briefing from MS or RBS on the oil spill.	Time:
	As directed by the Incident Commander, assume role of the Operations Section Chief.	
	Notify upstream and downstream P&CMs/RBSs and OCs to mobilize manpower and equipment as necessary.	Time:
	Deploy equipment and personnel to site of the incident.	Time:
	Supervise containment, control, and recovery actions.	
	Update equipment and personnel lists on computer.	
	Prepare and maintain the “Unit Log” (Form ICS 214) throughout the response.	
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.	Time:

Pipeline/Facility – Spill Discovered OCC Checklist

Section:

✓	**Check Off All Completed Tasks**	
	Upon receiving a call reporting an oil spill, gather all the information necessary to report the incident and support the response effort.	Time:
	Prepare and send “Event Notification” (Form 2124) if applicable and other notifications in accordance with Department Operating Procedures (DOPs) related to the estimated volume of the spill.	Time:
	Keep a record of all activities.	
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.	Time:
Obvious Leaks - Pipeline:		
	Shut down all pump stations upstream of the probable spill area.	
	Initiate a CLOSE remote gate valves (RGVs) command to the station upstream of the suspected spill area.	
	Evaluate necessity of shutting down the remainder of the pump stations downstream of the spill site after the RGVs are closed.	
	If necessary, or as requested, act as liaison between reconnaissance, operational onsite personnel, and the Incident Commander.	
	Notify Pipeline Manager or Duty Officer (during non-duty hours).	
	Keep a record of all activity.	
	Log event on the Spill Reporting System.	
	Assign an Authorization for Expenditure (AFE) for cost-tracking purposes.	
	Complete and fax an “Event Notification” (Form 2124).	
Reported Leaks:		
	NOTE: Suspected leaks may be reported by outside parties (surveillance reports, Alyeska or contractor personnel, Alaska State Troopers, and members of the public). These reports should be carefully analyzed to ensure that false alarms are avoided.	
	Log details of report.	
	Notify Lead Controller.	
	Dispatch Alyeska representative to the site, if not already there.	
	Check and log status of data being scanned at points adjacent to the site of the suspected leak.	
	If leak becomes obvious and is confirmed, initiate actions details under “Obvious Leaks - Pipeline” above.	

1.1.4 Pipeline/Facility Response Organization Checklists

Specific actions of the initial ICS positions are described in the following checklists. Complete descriptions of all positions are provided in Volume 1, Section 3.3, “Incident Command System.” These position checklists apply to the On-Scene Command and the Incident Management Team functions as may be needed depending on the size of the incident.

Incident Commander Checklist (On-Scene Command)

Section:

✓	**Check Off All Completed Tasks**
	Obtain briefing on situation.
	Determine level of staffing required to support the response to the incident.
	Notify Pipeline Manager or Duty Officer (during non-duty hours).
	Fax a copy of the completed “Initial Incident Briefing” package (Form ICS 201) to the FEOC (x 7966).
	Start and maintain a “Unit Log” (ICS Form 214).
	Set up the incident local Emergency Operations Center (EOC).
	Brief Command and general staff.
	Set incident objectives based on the initial site assessment reports.
	Take all safe measures to contain, control, and recover the spill.
	Verify with the Planning Section Chief that the “Initial Incident Briefing” package (Form ICS 201) has been updated with current information and transmitted as necessary.
	Mobilize Fairbanks Initial Response Team (FIRT) as required.
	Ensure status updates are conducted at regular intervals and required information is presented and sent to the responsible personnel.
	Monitor response activities to ensure actions will achieve incident objectives.
	Ensure that required outside resources are handled in an efficient manner.
	Work with the Public Information Officer to ensure that correct press information is released.
	Establish Unified Command upon arrival on scene of state and/or federal agency representatives.
	Review and approve the Incident Action Plan (IAP).
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

Operations Section Chief Checklist

Section:

✓	**Check Off All Completed Tasks**
	Contact Baseline Contractor Foreman to determine the tactics to be employed based on the Initial Site Assessment Report, Contingency Plan requirements, and incident objectives.
	Mobilize equipment, supplies, and manpower to the spill site.
	Start and maintain a “Unit Log” (ICS Form 214).
	Meet with Security and designate access control points.
	Ensure completion of the Site Safety Plan by Fire Safety Officer (SO) or competent designee.
	Gather necessary plans, maps, and forms that will assist with creation of the “Initial Incident Briefing” package (Form ICS 201) and subsequent IAP development.
	Contact Mutual Aid Partners if applicable.
	Verify that the “Medical Plan” (Form ICS 206) (first aid station, site safety review, and evacuation) for each division is under development.
	Assign person(s) to handle resource/transportation requests until the Logistics Section becomes functional.
	Provide information required for development of a communications plan.
	Review and verify that response actions are adequate to meet the incident objectives.
	Evaluate security control points and modify as necessary to protect responders and general public.
	Determine location of staging areas and appoint Staging Area Manager.
	Request permit to store oil waste.
	Request other permits from the Environmental Unit Leader, as required, to allow implementation of the Contingency Plan strategies and tactics.
	Ensure that decontamination centers are established.
	Continue to evaluate adequacy of response/containment/cleanup activities and modify actions and organization as necessary to meet the incident objectives.
	Develop the tactical operations portion of the IAP.
	Compile task force assignments during first half of the shift for input into the “Operational Planning Summary” (Form ICS 215).
	Present the “Operational Planning Summary” form at the tactics meeting at the end of the first half of the work shift.
	Finalize the “Operational Planning Summary” form with the Logistics Section Chief and Resource Unit Leader at the planning meeting.
	Attend shift briefing at the end of the shift and go over the “Div/Group/Task Force Assignment” (Form ICS 204) with Division Supervisors.
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

Planning Section Chief Checklist

Section:

✓	**Check Off All Completed Tasks**
	Obtain briefing from Incident Commander.
	Supervise preparation of the IAP.
	Start and maintain a “Unit Log” (Form ICS 214).
	Ensure general welfare and safety of Planning Section personnel.
	Staff the Planning Organization.
	Establish information requirements and reporting schedules of all ICS organizational elements for use in preparing the IAP.
	Supervise Unit Leaders for the collection and dissemination of continual and accurate information.
	Plan schedules for the ICS meetings and display in the Incident Command Post.
	Provide periodic prediction on incident potential, risks, and hazards.
	Assemble information on alternate strategies.
	Identify need for use of specialized resources and permits.
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

Logistics Section Chief Checklist

Section:

✓	**Check Off All Completed Tasks**
	Obtain briefing from Initial Incident Commander.
	Verify “Medical Plan” (Form ICS 206) is being addressed.
	Start and maintain a “Unit Log” (Form ICS 214).
	Ensure general welfare and safety of Logistics Section personnel.
	Staff Logistics Organization.
	Collect all logistics requests.
	Supervise Unit Leaders for the collection and dissemination of continual and accurate information.
	Provide current information to the Initial Incident Commander on resources ordered, including estimated time of arrival. Establish a close working relationship with the Resource Unit Leader in the preparation of the “Operational Planning Summary” (Form ICS 215).
	Review “Incident Radio Communications Plan” (Form ICS 205) for effectiveness.
	Provide food service, living quarters, and work space as needed.
	Inform the Resource Unit Leader of resource status as information is obtained and confirmed.
	Ensure that requests for personnel, transportation, materials, and supplies are promptly addressed and supplied within the required timeframe.
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

Safety Officer Checklist

Section:

✓	**Check Off All Completed Tasks**
	Obtain briefing from Incident Commander and Operations Section Chief.
	Start and maintain a “Unit Log” (Form ICS 214).
	Respond to incident site with gas detector to determine proper personal protective equipment (PPE) required for response personnel.
	Review and complete the “Site Safety and Control Analysis” (Form ICS 201-5) before beginning any response activities beyond that of the SO’s initial site evaluation. The information about the site gathered by the SO will be documented on this form and communicated to responders. A rough sketch of the area showing the spill site control zones, vapor reading levels, and recommended work sites will be attached. The “Cover/Map” (Form ICS 201-1) can be used for this purpose.
	Secure the area:
	Evaluate the spill area to determine wind direction, velocity (approximately) and proximity to ignition sources, such as running equipment and non-intrinsically safe electrical equipment.
	Keep all potential ignition sources upwind of the spill scene.
	Notify the Security Officer for assistance in controlling access to the area.
	Hazard Control Zones:
	Once atmospheric testing has been completed, the SO will establish hazard control zones for the spill area. 1) **Hot Zone** usually will be the area immediately surrounding the spill. This zone is considered to always potentially contain vapors that exceed the threshold limit value (TLV) or permissible exposure limit (PEL) exposure values. Personnel must use PPE commensurate with the potential exposure, and response equipment may be at risk of accidentally igniting the spill. 2) **Warm Zone** will be the area adjacent to the hot zone perimeter. This zone is considered to have a potential atmospheric vapor level equal to or greater than the TLV or PEL exposure values. 3) **Cold Zone** will be the area outside the warm zone perimeter. This area is always expected to have vapor levels less than TLV or PEL exposure values. The command activities and other support functions are located in the cold zone.
	Ensure that decontamination facilities have been established.
	Conduct a safety briefing to inform responders of incident site hazards.
	Conduct an inspection of the incident site.
	Conduct an inspection of all other work sites.
	Review control action outlines in the “Initial Incident Briefing, Initial Incident Organization” package (Form ICS 201-3P).
	Prepare and issue a “Health and Safety Message” (Form ICS 223).
	Request additional safety support if required.

✓	Check Off All Completed Tasks
	Review and comment on the “Medical Plan” (Form ICS 206).
	Review IAP.
	Investigate accidents/incidents, if they occur.
	Ensure that responder has proper Hazardous Waste Operation and Emergency Response (HAZWOPER) certification before being dispatched to the incident site.
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

Security Officer Checklist

Section:

✓	**Check Off All Completed Tasks**
	Obtain briefing from Initial Incident Commander.
	Notify the main gate guard of your contact phone number and have the main gate guard initiate the weather report.
	Start and maintain a “Unit Log” (Form ICS 214).
	If sabotage is suspected, take the appropriate actions to secure the scene and protect responders.
	Notify and request Corporate Security to activate the major incident plan for your area, if needed.
	Notify respective Alyeska Linewide Security Supervisor and request additional support if needed.
	Notify local law enforcement, Alaska State Troopers or city police, and give information and request support as needed.
	Request movement of guards or dispatch of additional guards through security contractor. Request equipment as required to support security activities.
	Provide updates to keep the Incident Commander aware of status of all security actions.
	Brief arriving security and law enforcement personnel.
	If major injury or fatality occurs, protect the scene and notify local law enforcement agencies.
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

Task Force Leader Checklist

Section:

✓	**Check Off All Completed Tasks**
	Obtain briefing from Division/Group Supervisor and understand incident objectives.
	Ensure that all personnel in the crew have the proper PPE and gear necessary to perform their tasks.
	Ensure that all personnel are familiar with all established safety and security zones.
	Review assignments and assign tasks to the crew.
	Ensure the general welfare and safety of the crew.
	Follow tactical guidelines suggested in the Pipeline Oil Discharge Prevention and Contingency Plan for the appropriate contingency area and segment for the incident area.
	Take all available measures to safely contain, control, and recover the product.
	Monitor work progress and make changes when necessary.
	Determine need for additional assistance on assigned tasks.
	Submit progress reports to Division/Group Leader at required intervals via fax, phone, or radio communication.
	Report special events and concerns.
	Submit information to Division/Group Leader for preparation of the “Operational Planning Summary” (Form ICS 215) and “Incident Action Plan, Division/Group Assignment List” (Form ICS 204).
	Maintain “Unit Log” (Form ICS 214).
	Ensure that all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response.

1.2 REPORTING AND NOTIFICATION [18 AAC 75.425(e)(1)(B)]

1.2.1 Initial Reporting [18 AAC 75.425(e)(1)(B)(i)]

Any Alyeska employee or contractor employee discovering a spill is required to report the spill to his or her immediate supervisor. Failure to report a spill may result in serious disciplinary action or personal criminal liabilities. If in doubt, report all observations.

The supervisory person receiving the report of a spill, or possible spill, will report the spill to the Alyeska OCC Pipeline Controller. See Table 1-1.

The OCC Pipeline Controller will initiate an internal and external reporting sequence to ensure notification of response personnel, senior management, and government agencies. The reporting sequence and actions initiated are diagramed in Figure 1-3. Any initial reports of suspected or actual spills originating from pipeline monitoring instruments or from the general public will also follow the notification process through OCC.

The OCC Controller reports to the Pipeline Manager or Duty Officers and serves as a single point of contact (SPOC) for notification and mobilization of response resources, especially after normal business hours. Depending on the magnitude of the incident, company-wide resources can be mobilized quickly and efficiently if needed.

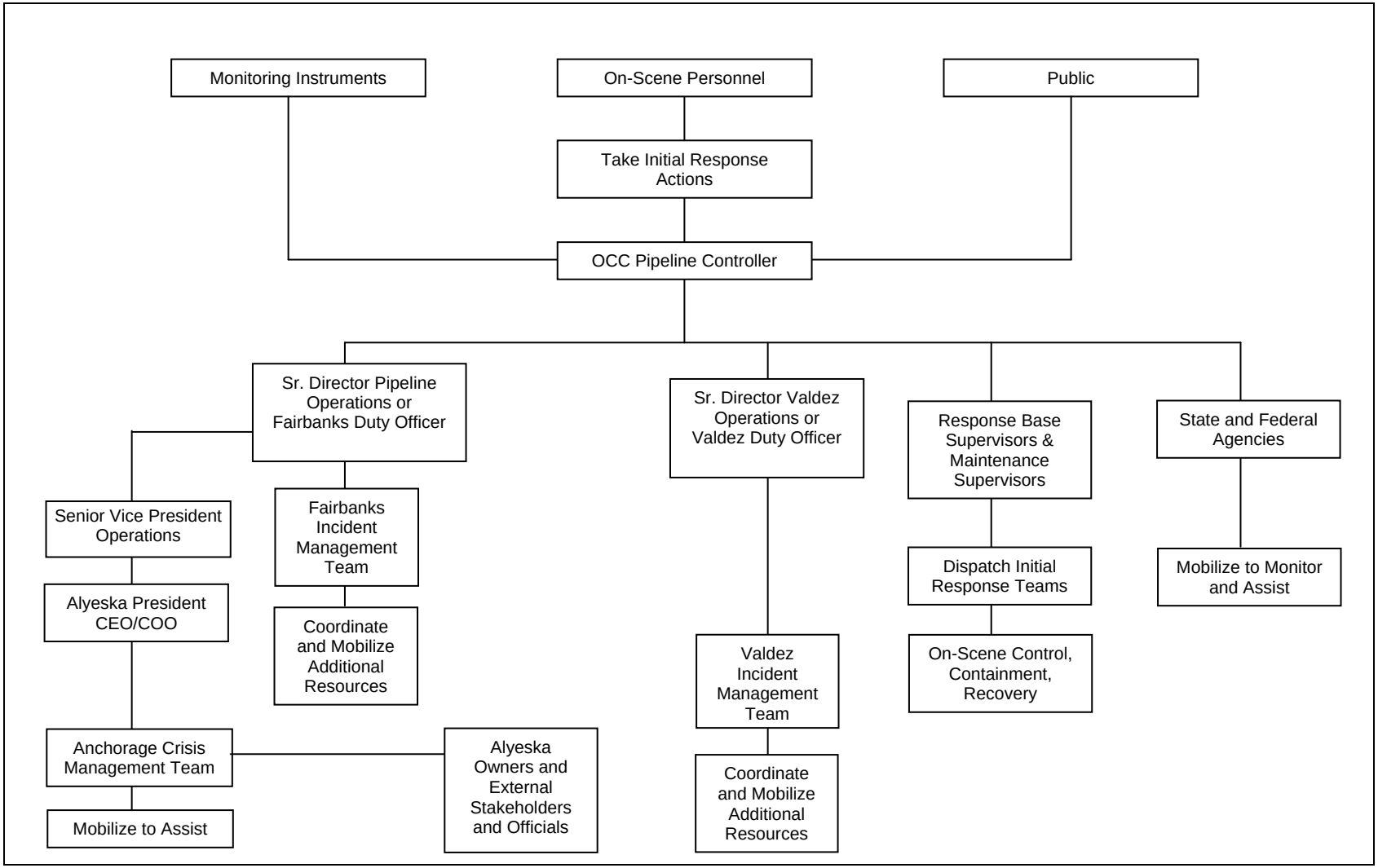

FIGURE 1-3 SPILL DETECTION AND MOBILIZATION

1.2.2 Emergency Contacts

1.2.2.1 Emergency Contact Phone Numbers

Alyeska maintains a computer-based *Emergency Telephone Book* identifying emergency response personnel and their contact telephone numbers. The *Emergency Telephone Book*, considered a "Supplementary Information Document" to this plan, is accessible on Alyeska's A-Net (intranet) system and can be viewed at any time. Hard copies are routinely printed and available to personnel in command centers and response kits.

Changes to contact phone numbers are updated in the A-Net *Emergency Telephone Book* within 5 days of notification of change. The Contingency Response Planning Manager is responsible for making the change notifications.

Form 10800, "IRT Personnel Form," lists the personnel available for reconnaissance and/or spill response at all active pump stations and response bases. A site-specific version of the form is maintained in Outlook in: \\Public Folders\All Public Folders\OSCP Team\Pipeline Personnel and Equipment Availability. At each facility, the form is reviewed daily.

Contact numbers and call-out procedures for primary response action contractors are provided in Volume 1, Section 1.5.3, "Procedures to Notify and Mobilize Response Action Contractors."

TABLE 1-1 EMERGENCY CONTACT PHONE NUMBERS

Emergency Contact	Alyeska Ext.	External Numbers	Pager and Cellular Numbers
Operations Control Center	6600	(907) 787-6600	(907) 787-6604 (fax)
External Public Reporting Line	Not applicable	(907) 835-4509	
Prudhoe Bay Response Base/PS01 O&M Supervisor	4102	(907) 787-4102	
Galbraith Maintenance Base/PS04 O&M Supervisor	4402	(907) 787-4402	
Prospect Response Base/PS05 O&M Supervisor	4502	(907) 787-4502	
Yukon River Response Base/PS06 Response Base Supervisor	4606	(907) 787-4606	
PS07 O&M Supervisor	4702	(907) 787-4702	
Fairbanks Response Base P&CM Coordinator	5406	(907) 787-5406	
Delta Response Base/PS09 O&M Supervisor	4902	(907) 787-4902	
Glennallen Response Base/PS11 Response Base Supervisor	5102	(907) 787-5102	
Fairbanks DIF Security	5707	(907) 787-5707	
Alyeska Main Switchboard	Not applicable	(907) 787-8214	
Fairbanks Duty Officer	Not applicable	Not applicable	(b) (6)
Valdez Duty Officer	Not applicable	Not applicable	Weekly Duty Roster

Note: *To call an Alyeska extension, first dial (907)787-XXXX (Anch.) or (907) 450-XXXX (Fbks).*

1.2.3 Government Reporting Requirements

Reporting requirements vary, depending upon the type of substance spilled, volume discharged, and the receiving environment. Table 1-2 provides a summary of regulatory agencies that must be contacted and the method of notification.

Additional details on spill reporting are provided in *EN-43-007, Environmental Protection Manual: Spill Prevention, Reporting, and Cleanup.* If action requirements are unclear to the person reporting a spill, always report the spill to supervisory personnel and ask for clarification. If in doubt, report it.

TABLE 1-2 ALYESKA MATRIX FOR AGENCY CONTACTS REGARDING OIL SPILL REPORTING

Substance	Volume	Location	Agencies Contacted	Method of Contact
Petroleum-based products	(b) (7)	To land	ADEC PERP, BLM, ADEC IPP, ADNR	Monthly recordable spill log
Petroleum-based products	(b) gallons	To land	ADEC PERP, BLM, ADEC IPP, ADNR	Weekly letter
Petroleum-based products	(b) (7) (b) (7)	To land	ADEC PERP, BLM*, ADEC IPP*, ADNR*	Automatic initial printed report and telephone contact by OCC
Petroleum-based products	>(b) (7)	To land	ADEC PERP, BLM*, ADEC IPP*, ADNR*	Automatic initial printed report and telephone contact by OCC
Petroleum-based products	(b) (7) gallons	Inside buildings or into secondary containment	ADEC PERP, BLM*, ADEC IPP*, ADNR*	Monthly recordable spill log
Petroleum-based products	(b) (7)	Inside buildings or into secondary containment	ADEC PERP, BLM*, ADEC IPP*, ADNR*	Automatic initial printed report and telephone contact by OCC
Petroleum-based products	(b) (7)	To water	ADEC PERP, BLM*, ADEC IPP*, ADNR*	Automatic initial printed report and telephone contact by OCC

*Immediate verbal report provided if IMT response is activated.

The *Emergency Telephone Book* also contains contact numbers for various government agencies, pipeline corridor communities, land owners, native corporations, and primary response action contractors. A quarterly verification of phone numbers will be conducted and an update sent to JPO quarterly. Table 1-3 provides emergency phone numbers for JPO personnel.

TABLE 1-3 REGULATORY AGENCY EMERGENCY CONTACT INFORMATION

JPO Contact	Assigned Individual	Office Telephone	Fax Number
Federal	Ron Dunton	(907) 271-6613	
State Pipeline Coordinators' Office (ADNR)	Ray Jakubczak	(907) 269-6899	
JPO Liaison ADF&G	Lee McKinley	(907) 269-6411	—
ROW Issues ADNR	Jason Walsh	(907) 269-6419	—
U.S. DOT/OPS	Dennis Hinnah	(907) 271-4937 (b) (6) emergency cell	(907) 271-6581
U.S. EPA	Matt Carr EPA Office	(907) 271-3616 (907) 271-5083	— (907) 271-3424
BLM	Mike Wrabetz	(907) 271-1355	—
ADEC	JPO Unit Supervisor	(907) 269-6494	— —
ADEC Liaison	Ron Doyel	(b) (6) (cell) (907) 787-6707 (Valdez)	—
Oil Spill Response			
North of PS10	Tom DeRuyter	(907) 451-2145	(907) 451-2362
PS10 and South	Gary Folley	(907) 262-5210 x234 (b) (6) (cell) After hours: (800) 478-9300	(907) 262-2294
Environmental Specialist - Valdez	John Engles	(907) 835-4698	(907) 835-2429
U.S. Coast Guard - Valdez	Vessel Traffic Supervisor	(907) 835-7205 (24 hours)	(907) 835-7286
U.S. Coast Guard National Response Center	Duty Officer (24-hour number) (EST daytime) – or – On-Line Reporting Tool, http://www.nrc.uscg.mil/nrchp.html	 (800) 424-8802 (202) 267-2675	(202) 267-1322

1.2.4 Community, State, and Federal Government Coordination

Alyeska will coordinate notification and response actions with affected stakeholders via the Incident Command/Unified Command processes. State and federal agencies with direct oil spill response oversight, such as ADEC and U.S. EPA, may participate both at the Unified Command level and at section and unit levels. State and federal agencies with land and resources trustee responsibilities will participate through the Alaska Regional Response Team process. The North Slope Borough (NSB) will participate as the Local On-Scene Coordinator (LOSC) for coastal or inland spills within the NSB boundaries as defined in the North Slope Subarea Contingency Plan (Government Letter 24796, ADEC Approval Condition 6).

The Liaison and Public Information Officer positions of the ICS will contact the community and individual land owners. These two positions will work together at the beginning of the incident to gather information and disseminate it to potentially affected individuals, communities, and other interested parties. As the incident progresses, these positions will work in collaboration with the Unified Command and other government agency personnel to ensure that adequate information related to the response or potential impact is communicated to the public.

Alyeska maintains a pipeline corridor community telephone contact list. Alternatively, if a community or individual resident is immediately threatened by the oil spill, Alyeska will contact the local public safety organization or the Alaska State Troopers to assist in notification and evacuation, if necessary. Alyeska will take whatever actions are required to protect the health and safety of the general public.

Further discussion of the ICS and position responsibilities is provided in Volume 1, Section 3.3, “Incident Command System.”

1.3 SAFETY [18 AAC 75.425(e)(1)(C)]

Initial response to an oil spill can expose personnel to hazards, e.g., fire/explosion, hazardous vapors, noise, and working over water. Alyeska has developed and implemented many procedures and programs that mitigate or reduce these hazards. Many of these procedures and programs are located in *SA-38, Corporate Safety Manual*. Information on the hazards of crude oil, noise, cold stress, and dispersants can be found in the Safety Data Sheets (SDS) and Physical Agent Data Sheets in the Alyeska SDS computer system. This section will cover additional procedures and considerations needed for a safe response.

1.3.1 Initial Actions to Ensure Safety of Responders

When an oil spill occurs, notifications, mobilization of response resources, and protecting the safety of responders and the general public are needed. This section describes initial actions needed to ensure the safety of responders and the general public. Additional reference material is available in *SA-38, Corporate Safety Manual*, Requirement 1.5, "Crude Oil or Petroleum Product Spill Emergency and Post-Emergency Response," and is summarized below.

Initial actions:

1. Secure the spill area. Evaluate the potential for uninformed personnel or members of the general public to access the area. Block access to the spill area to prevent unauthorized personnel or public from entering the area.

2. Control access to the area. Notify Alyeska Security to provide assistance, either directly or through local or State police forces, in controlling access to the spill area.

3. Isolate or control ignition sources. Take action from a safe distance to isolate or control ignition sources in the general area of the oil spill.

4. Conduct an initial site safety characterization using the Site Safety and Control Analysis (Form ICS 201-5). An example of the form and information to gather is shown in Figure 1-4. The form is self-explanatory, and information requested will either be known at the time or unknown. If known, document the information on the form. If unknown, write "unknown" or "unk" on the form. Some requested information may be not applicable for every incident situation and documented as such by writing "N/A" on the form.

Entry to the spill site is only to accomplish initial source control, spilled oil containment, and spilled oil recovery actions. These actions relate to the information gathered and documented on the Site Safety and Control Analysis form. The person gathering the information will need to communicate it to the Initial Response Incident Commander as soon as possible so that follow-on response resources can be properly directed. Always ensure an egress point is identified prior to entry into the spill area.

The Site Safety and Control Analysis form must be completed prior to entry into the immediate spill area by response personnel for the purpose of taking "offensive" spill control and cleanup actions. Offensive actions are defined as control and cleanup actions in close proximity to the spilled oil where personnel could be expected to come in contact with the spilled oil.

Control actions that are “defensive” in nature can be taken by personnel at a safe distance from the spilled oil prior to the completion of the Site Safety and Control Analysis form. Defensive actions are defined as control or containment actions away from the immediate spill area where personnel would not be expected to come in contact with the spilled oil or hazardous vapors. Defensive actions would be blocking culverts, closing valves, and deployment of containment equipment prior to the arrival of the spilled oil at those locations. Actions of this type would be taken by response personnel/teams arriving on site prior to the completion of the Site Safety and Control Analysis form.

Alyeska pipeline

Initial Incident Briefing

ICS 201-5
Site Safety and Control Analysis

Incident Name:	Date Prepared:	Time Prepared:
Operational Period Date: From: To:	Operational Period Time: From: To:	

Site Control:

1. Is Site Control set up? ☐ Yes ☐ No	2. Is there an on-scene command post? ☐ Yes ☐ No If so, where:
3. Have all personnel been accounted for? ☐ Yes ☐ No ☐ Don't Know Injuries: ____ Unaccounted: ____	Fatalities: ____ Trapped: ____
4. Are observers involved, or are rescue attempts ongoing/planned? Observers: ☐ Yes ☐ No Rescuers: ☐ Yes ☐ No	5. Are decon areas set up? ☐ Yes ☐ No If so, where:

Hazard Identification, immediate signs of: (if Yes, explain in Remarks)

1. Electrical line/s down or overhead: ☐ Yes ☐ N/A		2. Liquid or solid products visible? ☐ Yes ☐ No ☐ N/A Type: ☐ Liquid ☐ Solid If known:_____
3. Wind Direction Across Incident: Direction (*i.e. NW*) : ____ ☐ Towards Response Position ☐ Away From Response Position	3a. (fm 201-1) Wind speed: ____	4. Is a safe approach possible? ☐ Yes ☐ No
5. Odors or smells? ☐ Yes ☐ No		6. Vapors visible? Color: ☐ Yes ☐ No ☐ N/A
7. Holes, ditches, fast water, ice depth hazards, cliffs, etc. nearby? ☐ Yes ☐ No ☐ N/A		8. Fire, sparks, sources of ignition nearby? ☐ Yes ☐ No ☐ N/A
9. Is local traffic a potential problem? ☐ Yes ☐ No ☐ N/A		10. Product placards, color codes visible? ☐ Yes ☐ No ☐ N/A
11. Other Hazard(s)? ☐ Yes ☐ No		**12. As you approach the scene from the upwind side, do you note a change in status of any of the above?** ☐ Yes ☐ No

Hazard Mitigation: Have you determined the necessity for any of the following:

1. Entry Objectives:		
2. Warning sign(s), barriers, color codes in place? ☐ Yes ☐ No		
3. Hazardous material being monitoring? ☐ Yes ☐ No	a. Sampling Equipment:	
b. Sampling Location(s):	c. Sample Frequency:	d. Personal Exposure Monitoring:
4. Protective gear / level:	a. Gloves	
b. Respirators:	c. Clothing	
d. Boots:	e. Chemical cartridge change frequency:	
5. Decon a. Instructions:		
b. Decon Equipment and Materials:		
6. Emergency Escape Route Established? ☐ Yes ☐ No Route:		
7. Field responders briefed on hazards? ☐ Yes ☐ No		
8. Remarks:		

Prepared By (print):	Company Name:	ICS Position:
Approved By (print):	Company Name:	ICS Position:

ICS 201-5, rev. 4 (3/7/13) kig

FIGURE 1-4 SITE SAFETY AND CONTROL ANALYSIS (FORM ICS 201-5) (PART 1 OF 3)

Alyeska pipeline

Initial Incident Briefing — **ICS 201-5 Site Safety and Control Analysis**

Purpose

The Initial Incident Briefing form provides the incoming Command and General Staff with basic information regarding the incident and the resources allocated to the incident. It also serves as a permanent record of the initial response to the incident. The Initial Incident Briefing form is used for managing the incident during the initial response phrase until the first operational period for which an IAP is prepared.

Preparation

The form is prepared under the direction of the initial Incident Commander for presentation to the incoming incident command. The 201-5 is 1 of 5 forms which make up the entire Initial Incident Briefing. The On-site Safety Rep/Officer completes the 201-5 form with information acquired by their observations as well as other responders, i.e. the IRIC).

Other Safety Requirements: Before entering a potentially hazardous work environment, IT MUST BE EVALUATED BY A COMPETENT PERSON*** to establish safe work practices, personal protective equipment, and other control procedures. At a minimum, lower explosive limit (LEL), Oxygen, and Benzene levels must be evaluated. Spill cleanup areas shall be controlled as "regulated areas." If Benzene vapors are or may be expected to equal the action level of .5ppm, then the area must be posted with the following warning:

Danger: Benzene Cancer Hazard -- Flammable -- No Smoking -- Authorized Personnel Only -- Respirator Required

***Competent Person:** OSHA defines *competent person* in 29 CFR 1926.32(f) as "one who is capable of identifying existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them."

Instructions

Incident Name: The name should include the source (i.e. Tanker xx, P/L MPxxx, PS Tank x).
Incident Location: nearest named geographic location (i.e., xx Creek, Point).
Date/Time: Month/Day/Year – 24 hour clock.
Operational Period: 'From' is the incident start time, 'To' is generally 0600 or 1800.
Site Control:
- 1: Site Control includes an isolation perimeter and access control points.
- 2: If "Yes", Describe coordinates of location.
- 3: List numbers for each non-zero category. Describe each occurrence either in Remarks (#8) or reference applicable accident report/s.
- 4: Explain any 'Yes's in Remarks (#8).
- 5: Indicate if the decon area is depicted on the 201-1 as it should be.

Hazard Identification (and immediate signs of)
- 1: If 'Yes' is indicated, circle whether lines are down and/or overhead.
- 2: If 'Yes' is indicated, check whether unidentified liquids and/or solids are visible.
- 3: If wind is present, write in the direction it is coming from and check whether it is blowing towards or away from response position.
- 3a: Approximate wind speed.
- 5: Only smells that are not natural, not normally present.
- 6: If 'Yes' is indicated, include the color.
- 7: If 'Yes' is indicated, circle which physical hazards are present. Continue explanation in Remarks (#8) starting with 'Haz ID #7'.
- 8: If 'Yes' is indicated, circle which fire hazards are present. Continue explanation in Remarks (#8) starting with 'Haz ID #8'.
- 9: If 'Yes' is indicated, continue explanation in Remarks (#8) starting with 'Haz ID #9'.
- 10: If "Yes" is indicated, list placards and color codes seen. Also note type of container, manufacturer label/s.
- 11: If 'Yes' is indicated, explain in Remarks (#8).
- 12: If 'Yes' is indicated, explain in Remarks (#8).

Hazard Mitigation
- 1: For Hot Zones, describe 2-5 simply-stated objectives.
- 2: For example, benzene and no smoking signs.
- 3: Further details in Haz Mit #8.
  - 3a: Equipment can include Combustible gas indicator, O_2 monitor, colometric tubes (type) HNU/OVA, etc.
  - 3b: If the location/s is/are depicted on the 201-1, so state.
  - 3c: Frequency can be continuous, hourly, etc.
  - 3d: Describe the procedures in effect for personal (sampling for on-site personnel) and medical monitoring.
- 4: List the Protection Level (A-D) including the specific PPE needs. For APRs, estimate the life of the respirator cartridge.
- 5(a): Describe Decon steps that need to be taken
- (b): Describe equipment and materials necessary for Decon.
- 6: Describe the route. If the route is depicted on the 201-1, state so.
- 8: Use 'Remarks for further explanations of the above items. Start with the item number (SC#x, HazID#x, HM#x).

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FIGURE 1-4 SITE SAFETY AND CONTROL ANALYSIS (FORM ICS 201-5) (PART 2 OF 3)

Prepared by: Print the name/company/ICS position of the person preparing the form.

Process Flow

- IMT Ops gets the field portion via radio/phone/fax from the lead field responders (for pre-positioned equipment), Staging Area Manager/s, and Staging Area Branch (and Logistics).
- Either at the Initial Incident Briefing or later, the 201 Briefing is distributed by Documentation to necessary IMT members (Command Staff, Sections Chiefs, Branch Directors, Division/Group Supervisors, and appropriate Planning and Logistics Unit Leaders). The original goes in the Incident File.
- The information on the 201 Briefing form is the starting point for the other ICS forms which take the information and then continue tracking their respective items. The Ops Section Chief and Incident Commander use the 201 to base their future strategy and tactics on. The 201-4 is used as initial input to the T-cards (ICS 219s) or other resource tracking system. The Staging Area Branch and Supply Unit use it to start their incident information files.

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FIGURE 1-4 SITE SAFETY AND CONTROL ANALYSIS (FORM ICS 201-5) (PART 3 OF 3)

1.3.2 Safety Officer

The incident SO position shall be staffed as soon as possible by a person capable of carrying out the duties of this position. Normally, this will be filled by a Fire/Safety/Industrial Hygiene Specialist (FSIH). The FSIH Specialist covers more than one pump station/response base area and may not be immediately available. The alternates for this position are a contractor/projects Safety Generalist, a P&CM, baseline personnel, or technician who will fill this role until the arrival of the FSIH Specialist. The assignment of the incident SO role to these primary and alternate personnel is based on their background skills and day-to-day job responsibilities related to safe work practices, use of flammable gas detectors, and safe work practices. Minimum training requirements for the initial incident SO position and the completion of the Site Safety and Control Analysis form are familiarity with:

- *SA-38, Corporate Safety Manual*
- The use of direct reading instruments to detect flammable vapors
- The field use of the ICS

The following safety personnel are available along the pipeline:

- Two to five field-based S/IH Specialists traveling the entire pipeline
- Two field-based S/IH Specialists traveling from VMT
- Safety Generalists (seasonal)

The FSIH Specialists travel to pipeline pump station and response base locations within the area of (b) (7)(F), (b) (3) The above listed personnel can be contacted by calling the pump station or response base control room or by contacting facility security. Additionally, all pump station/response base technicians, RBS, P&CMs, OCs, and baseline personnel are capable of using flammable vapor testing equipment and completing the Site Safety and Control Analysis form and information requirements.

Alyeska and contractor safety personnel normally work from 6 am to 6 pm. Technicians have rotating day and night work schedules (6 am to 6 pm and 6 pm to 6 am). At least one technician would always be immediately available.

As a follow-on activity, the incident SO will contribute to the IAP Safety Plan. This document will be issued to the second shift responders and will have information extracted from the “Site Safety and Control Analysis” as a basis in planning efforts for the next shift and define expanded air monitoring, personal monitoring, and medical monitoring requirements as needed.

A listing of SO pre-emergency and post-emergency responsibilities can be found in Volume 1, Section 3.3, “Incident Command System.”

1.3.3 Hydrocarbon Vapor Testing

At a minimum, the Oxygen, Lower Explosive Limit (LEL), Total Hydrocarbon, and Benzene level must be evaluated throughout the spill area. Refer to *SA-38, Corporate Safety Manual*, Requirement 3.21, "Portable Gas Detection Equipment," and Section 1.5, "Crude Oil or Petroleum Product Spill Emergency and Post-Emergency Response," for more specific gas testing procedures.

If only a combustible gas meter is available, initial air monitoring shall be performed while wearing a minimum of a half-face respirator and working from the upwind side. At a safe distance from the spill area, perform air monitoring for LEL and oxygen. If the LEL is above 2% the approach should be halted. If the LEL is less than 2% continue the approach. LEL measurements must be continuous as the spill perimeter is approached.

Additional air monitoring will be performed for total hydrocarbons (THC), benzene, LEL, hydrogen sulfide (H_2S), and oxygen throughout the entire spill area to fully characterize the atmospheric conditions. Once the benzene and total hydrocarbon levels are known the appropriate respiratory protection will be determined. Personnel should consult the current version of SA-38 for permissible respiratory protection practices and allowable air contaminant levels for respirators. Periodic air monitoring will be performed to re-validate previous monitoring results, and re-validate the respiratory protection in use.

1.3.3.1 Crude Oil Characteristics

An important element in planning for oil spill response operations is an understanding of crude oil characteristics.

The chemical composition of Alaska North Slope (ANS) crude can be divided into three categories for the purpose of determining health and safety effects as follows:

- Aliphatic hydrocarbons
- Aromatic hydrocarbons
- Polyaromatic hydrocarbons

Typical fresh crude oil is composed of 90% aliphatics, less than 10% aromatics, and less than 1% polyaromatic hydrocarbons (PAHS). H_2S can be found in North Slope crude oils. Its concentration varies as a function of the producing field and the concentration of oil from these fields in the total volume of incoming pipeline receipts.

The light end components (aromatics/PAHs) are easily volatilized (evaporated) from the spilled crude and will generally dissipate in temperatures above 30°F within 24 to 48 hours, reducing airborne concentrations below harmful levels for personnel exposure and flammability.

The "Site Safety and Control Analysis" (Form ICS 201-5) identifies follow-on actions (checklist) to be considered by the incident SO or competent designee and rolled into the Incident Action Plan.

Detailed information available to assist in the completion of these forms and associated activity can be found in *SA-38, Corporate Safety Manual*, Requirement 1.5.

Oil spill incident response activities will be conducted in accordance with applicable state and federal standards.

1.3.4 Fire Prevention and Control

Site safety and site activity planning also consider possible sources of ignition of spilled oil. A complete discussion of this potential and prevention actions are found in Volume 1, Section 1.6.2, “Methods to Prevent or Control Potential Fire Hazards.” Should an oil spill involve a fire or should the spilled oil vapors ignite and cause sustained combustion, the Fire Specialist will assume the position of Operations Section Chief. The Incident Commander will order suspension of front line oil spill containment, control, and recovery actions that have the potential of contributing to the fire incident or risk of injury to personnel and damage to equipment. Oil spill response personnel and equipment at risk due to the fire will be withdrawn to a position of safety. All command center and field-assigned oil spill response personnel will become available for reassignment to assist in the fire response activity according to need and level of training.

The Incident Command System is an all-risk system and therefore can be functional as a fire suppression organization very quickly. The only personnel position change would be the Fire Specialist assuming the position of Operations Section Chief. The fire response would proceed in accordance with Emergency Contingency Action Plans for pump stations and Pre-Fire Plans.

1.3.5 Hazard Control Zones

Once atmospheric testing has been completed, the SO will establish hazard control zones for the spill area.

Hot zone usually will be the area immediately surrounding the spill. This zone may potentially contain vapors that exceed the TLV or PEL exposure values. Personnel must use PPE commensurate with the potential exposure.

Warm zone will be in the area adjacent to the hot zone perimeter. This zone has a low potential to contain vapors that exceed the TLV or PEL exposure values.

Cold zone will be the area outside the warm zone perimeter. This area is always expected to have vapor levels less than the TLV or PEL exposure values. The command activities and other support functions are located in the cold zone.

Note: Continuous surveillance of the spill area will be performed to verify proper characterization of the hazard zones. Surveillance of the spill area will include evaluation of the spill status, work task in progress, and atmospheric monitoring.

The development of a site safety plan and the establishment of the vapor monitoring frequency will be completed by the SO and issued with the site-specific Incident Action Plan. The site safety plan will include a rough sketch of the area showing the spill site, and control zones, specific hazard mitigation steps, spill site vapor monitoring, and personnel medical monitoring if needed. Prior to completion of the site safety plan the ICS form 201-5 will be used to provide hazard information, PPE requirements and the air monitoring requirements at the spill site.

1.4 COMMUNICATIONS [18 AAC 75.425(e)(1)(D)]

1.4.1 Telecommunications: Contingency Overview

This section describes the telecommunication systems and activities used to support normal prevention operations, as well as emergency response measures. Telecommunication systems are either permanently installed or stockpiled for rapid deployment to locations dictated by an actual spill. Links to telecommunication networks are in place for rapid mobilization of oil spill cleanup activities. The telecommunications function for oil spill response is organized in accordance with the ICS (refer to Volume 1, Section 3.3, “Incident Command System.”

This telecommunication support plan takes into consideration the need for telecommunications with state, local, and federal agencies with which day-to-day operations are coordinated, as well as those agencies that will be involved in the response to a spill incident.

In the event of an oil spill, initial response activities will use telecommunications systems already in place along the pipeline corridor. If a sustained spill response is required, additional communications equipment will be mobilized to direct and coordinate cleanup operations.

The pipeline communication network includes fiber optic cable, leased microwave and satellite systems, common carrier circuits, telephones, in-plant radios, a mobile radio system, and control stations for RGVs. From a risk assessment standpoint, the critical communication subsystems are those that transmit leak detection data, control RGV operation, or coordinate personnel during spill mitigation.

(b) (7)(F), (b) (3)

The voice communication system consists of a private telephone network and a mobile very high frequency (VHF) system. Two party-line channels on the microwave system are allocated for voice communications between all stations and OCC. The mobile VHF radio system consists of a VHF radio base and repeater stations located at strategic microwave repeater sites, microwave control channels, and interconnecting links to the telephone network throughout the system.

1.4.2 Telecommunications: Daily Operations

1.4.2.1 Radio Channels Available

Table 1-4 details radio communications resources, pump station personnel, response base personnel and line-wide crews that will be relied upon during a response are trained in the use of these resources.

TABLE 1-4 RADIO CHANNELS AVAILABLE

Published 29 November, 2010

2010 Master Channel Plan

2010 ALYESKA VHF MOBILE RADIO FREQUENCY PLAN Rev 10.1									
Chan. #	Channel Display	Channel Description	Location	Transmit Frequency	Receive Frequency	TPL/ DPL	TPL/DPL FREQ.	Call Sign	Comments
(b) (7)(F), (b) (3)									
			Zone 2						
			APSC Portable VHF Repeater/Talk Around Channels Statewide						
(b) (7)(F), (b) (3)									

TABLE 1-4 (CONTINUED)
RADIO CHANNELS AVAILABLE

Published 29 November, 2010

2010 Master Channel Plan

	Chan. #	Channel Display	Channel Description	Location	Transmit Frequency	Receive Frequency	TPL/ DPL	TPL/DPL FREQ.	Call Sign	Comments
				Zone 3						
				ACS Tactical Channels Statewide						
(b) (7)(F), (b) (3)										
				ACS Fixed VHF Repeater/Talk Around Channels on the North Slope						
(b) (7)(F), (b) (3)										
				Zone 4						
				ACS Logistics VHF Repeater/Talk Around Channels North Slope						
(b) (7)(F), (b) (3)										

TABLE 1-4 (CONTINUED)
RADIO CHANNELS AVAILABLE

Published 29 November, 2010

2010 Master Channel Plan

Chan. #	Channel Display	Channel Description	Location	Transmit Frequency	Receive Frequency	TPL/ DPL	TPL/DPL FREQ.	Call Sign	Comments
Zone 5									
APSC OSCP Comm Plan Channels									
Alyeska Radio Telephone System (ARTS)									
(b) (7)(F), (b) (3)									
Alyeska Line of Sight (Simplex) Task Force Channels									
(b) (7)(F), (b) (3)									
APSC Portable VHF Repeater/Talk Around Channels Statewide (cont.)									
(b) (7)(F), (b) (3)									

Notes:

1. VHF Marine Transmit Frequencies are not authorized for use in vehicle mounted radios.
2. TALK AROUND channels will have "T/A" in the display indicating that it is programmed to talk mobile to mobile without using a repeater. This is also known as Simplex.
3. ACS is the acronym for Alaska Clean Seas.
4. The pipeline corridor consists of the area between 144 West Meridan and 152 West Meridan from Prudhoe Bay to Valdez.
5. Statewide is restricted to "West of Line C" which is described as a North/South line running parallel to the Alaskan/Canadian Border approximately 50 miles to the west.

The Oil Spill Channels (OS-29 thru OS-69) are grouped by licensee and will not always have sequential channel displays. OS-29 thru OS-52 and OS-65 thru OS-68 are Alaska Clean Seas Licensed Channels. OS-37 and OS-38 are licensed by both ACS and Alyeska, OS-53 thru OS-64 and OS-69 are Alyeska Pipeline Oil Spill Licensed Channels.

Definitions:
kmra = kilometer radius, CSQ = Carrier Squelsch - no PL or DPL Code, PL Code = Analog Private Line Code, DPL = Digital Private Line Code

1.4.2.2 Alyeska Radio-Telephone System (ARTS)

(b) (7)(F), (b) (3)



1.4.2.3 Telephone Systems

(b) (7)(F), (b) (3)



1.4.2.4 Data Systems

(b) (7)(F), (b) (3)

[redacted]

1.4.3 Telecommunications: Spill Response

(b) (7)(F), (b) (3)

[redacted]

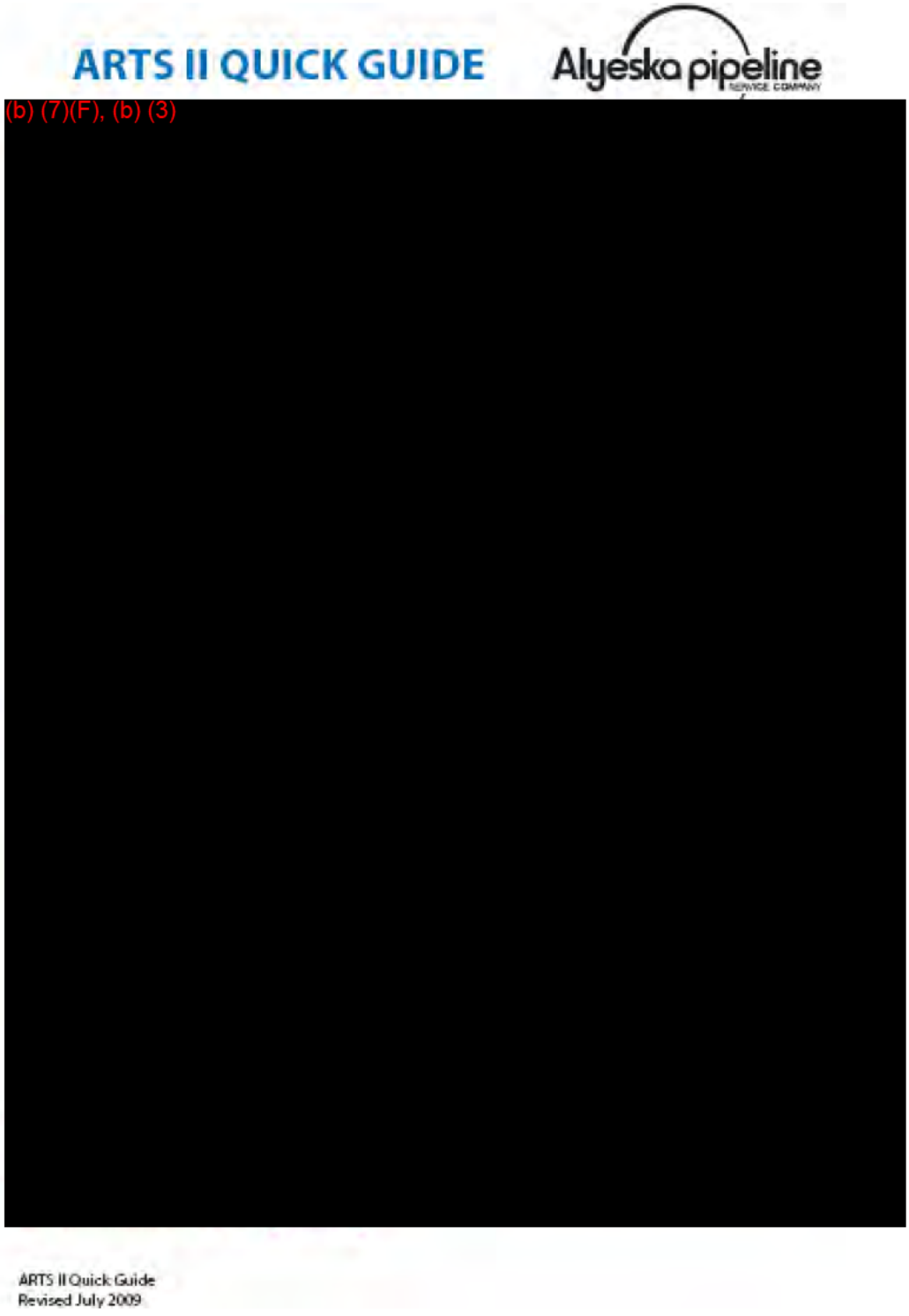


FIGURE 1-5 ALYESKA RADIO-TELEPHONE SYSTEM (ARTS)

TABLE 1-5 EMERGENCY COMMUNICATIONS EQUIPMENT DEPLOYMENT GUIDE SUMMARY

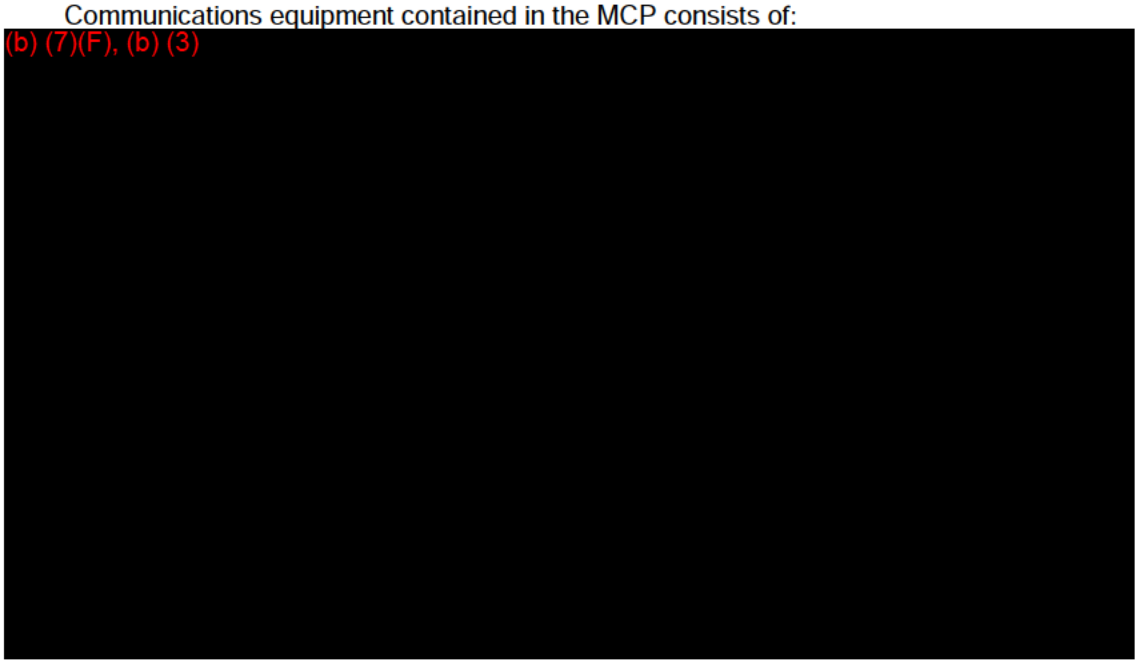
Time Frame (hours)	Deployments
Initial (2 to 12)	• Three portable suitcase repeaters to support two operations channels and one logistics channel • Mobile base radios to field teams and one mobile base radio to field operations • Mobile Command Post dispatched to support field operations
12 to 36	• Mobile communications modules (MCMs) 1 and 2 deployed to replace portable suitcase repeaters if possible • MCM3 deployed to base operations location to supply base radios, telephone, fax, and modem lines • Activate dispatcher console, supply tone remotes to Operations if feasible • Activate battery recharging station • Order relief technicians
36 to 96	• Relocate portable suitcase repeaters to problem communication area(s) • Request replacement handheld radios and handheld batteries and locate repair spares of issued equipment
Greater than 96	• Seek additional outside resources as necessary

1.4.3.1 Mobile Command Post (MCP)

The Mobile Command Post (MCP) is an all-weather, 53-foot expandable tractor trailer that is fully self-contained for heat, power, and communications. During an oil spill response, the MCP provides the critical communications link between field units and Alyeska managers in the Fairbanks Emergency Operations Center (FEOC). The MCP would be dispatched as needed during the first few hours of the incident.

Communications equipment contained in the MCP consists of:

(b) (7)(F), (b) (3)



- 56 kw auxiliary generator
- 6 portable Iridium satellite phones
- 10 MT 2000 VHF handheld radios
- GPS
- 100 additional phone lines
- 1 fax
- 2 printers/scanners
- 1 plotter
- 1, 30' × 30' auxiliary all weather tent attachment
- 1 conex support unit

1.4.3.2 Emergency Operations Center (EOC)

The Incident Commander will be responsible for activating the EOC. The exact location of the EOC will be dependent upon the location of the spill and the size of the incident. Typically, the EOC would be located at a response base, a pump station, or Alyeska facility in Valdez or Fairbanks. The EOC will be supported by radio, telephone, data, video, and fax communications systems in support of cleanup efforts. The Communications Unit Leader will keep the Incident Commander constantly aware of communications capabilities and limitations.

In the event the EOC becomes overloaded from a communications perspective, Alyeska has one or more of the following options.

- Restrict communications use to emergency-related activities only.
- Bring additional communications equipment to meet anticipated needs.
- Limit staffing at the EOC to “essential personnel only” and have support staff located at a larger facility. Protocols and procedures for communicating between the EOC and the larger support EOC would be implemented.

1.4.3.3 Personnel for Spill Response

Organization

Response telecommunications will be organized and managed under the ICS (refer to Volume 1, Section 3.3, “Incident Command System”). The telecommunications unit is supervised by the Communications Unit Leader who reports to the Logistics Section Chief. The size and nature of the staff reporting to the Communications Unit Leader will depend on the extent of the response required. A typical telecommunications organization for a moderate spill incident is shown in Figure 1-6.

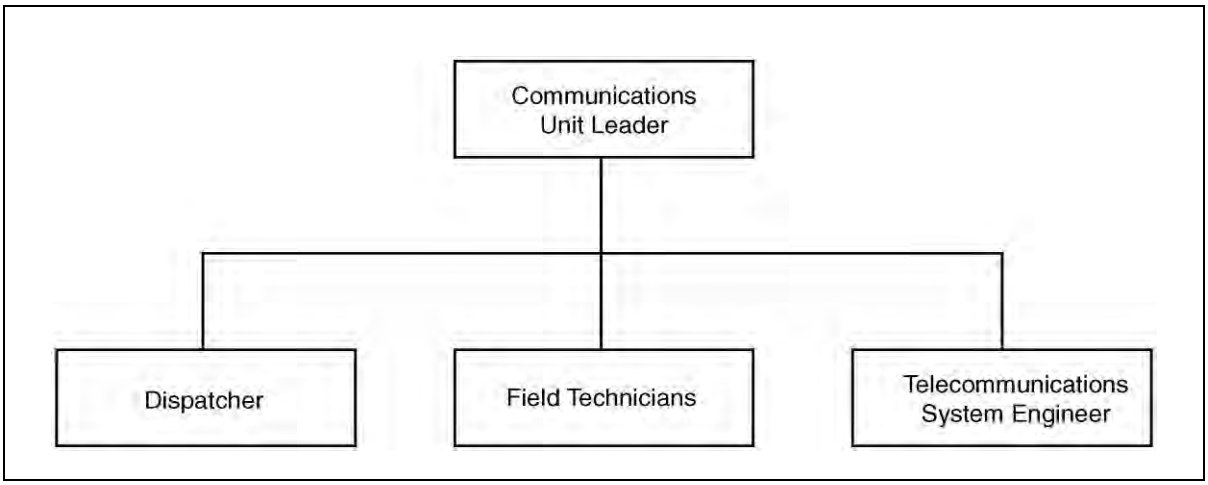


FIGURE 1-6 COMMUNICATIONS ORGANIZATION
(One individual may fill more than one of these positions.)

1.4.3.4 Duties

Communications Unit Leader

The Communications Unit Leader will set up and operate the needed telecommunications systems, order supplemental communications equipment, verify that extended telecommunications equipment has been installed for optimum coverage, activate telephone systems and data networks ("nets"), and develop the Incident Radio Communication Plan for each operational period.

Spill Response Dispatchers

Spill Response Dispatchers receive and transmit radio and telephone message traffic in support of incident personnel and agencies external to the incident, provide dispatch services, and maintain 24-hour radio logs for documentation. The message center dispatcher receives, records, and routes information concerning critical oil spill tactical activities. Runners may distribute hard copy materials to ICS staff members. There is typically an Operations and a Logistics Dispatcher on duty. Radio operators will communicate information from specific sites or operations to the EOC via the dispatch center. The dispatch center staff normally receives equipment supplied from the Alyeska Communications, Electronics, and Instrumentation Depot.

Technical Supervisor

The Telecommunications Technical Supervisor oversees the installation of all communications systems required by the Communications Unit Leader. Telecommunications technicians verify that incident telecommunications radio and telephone systems are operable (install repeaters, antennas, etc.), maintain an inventory of telecommunications equipment, distribute and recover equipment and resources, and service communications equipment. The technical supervisor and field technicians normally are assisted by the Manager of Information Systems - Pipeline Maintenance.

Systems Engineer

The Telecommunications Systems Engineer is responsible for planning the technical aspects of the field support telecommunications systems, and may also serve as the alternate Communications Unit Leader.

1.4.3.5 Alyeska Radio–Telephone System (ARTS II)

The Alyeska Radio–Telephone System (ARTS II) provides both mobile-to-mobile and mobile-to-telephone very high frequency (VHF) radio communications at nearly any point along the pipeline ROW and parallel public road system. The system depends on a line-of-sight between the user and repeaters for maximum performance of the system.

To enhance field-unit-to-field-unit and field-unit-to-Command Post communications during emergency events, Alyeska maintains various sized portable communications modules (10 x 20 ft to suitcase-sized), and small self-contained radio repeater kits at each response base.

Emergency Response

In the event of an emergency or spill, initial response activities will use the ARTS communications system in place along the pipeline corridor. As an incident grows in magnitude, the Alyeska Emergency Oil Spill Communications Plan (Table 1-6) will be used to command, control, and support the incident. Zone 5 on all Alyeska handheld and mobile radios are programmed with the appropriate pipeline communication plan.

As ICS is fully implemented, the field Communication Unit Leader or MCP Dispatcher develops a Communication Plan (ICS-205) as part of an Incident Action Plan (IAP). Alyeska's Emergency Oil Spill Communication Plan will be used to assign channels to each function and to fill out ICS-205.

Operations Assigned Channels

The Operations Section Chief (Ops) or Deputy Operations Section Chief (Deputy Ops) is responsible for all tactical deployment of resources in the field. Ops must scan several channels in order to effectively command and control the incident. Several repeater and simplex (line-of-sight) channels have been designated for the Operations Section, including four simplex channels(b) (7)(F), (b) (3) exclusively for task forces. As conditions require, repeater channels have been assigned to Operations that are programmed into 3-watt suitcase repeaters, available at each response base.

Surveillance

Aerial surveillance is one of the key tools used to track spill location and to plan the response. Surveillance will be done primarily by helicopter, but may also be done with fixed-wing aircraft. Communications between the surveillance aircraft, EOC, and ground crews is by VHF radio, usually on the ARTS or VHF frequencies. Communications between aircraft and response vehicles and vessels is by VHF radio.

Staging Area Assigned Channels

Field units and task forces will order supplies and equipment using the Staging Area assigned channels: (b) (7)(F), (b) (3)). The Staging Area Manager will then consolidate resource orders and relay them through the assigned Logistics channels.

Logistics Assigned Channels

Logistics channels (b) (7)(F), (b) (3) (repeater), will be used by Logistics for relaying and consolidating orders and transport request coming from the Staging Area to the IMT-Logistics (FEOC) or directly to response bases. Due to distances and availability of land telephone lines, the ARTS telephone capability may be used for Logistical ordering and support. Normally, if available, telephones are the preferred method of transmission of resource orders from the field to the IMT or to response bases. Satellite phones are also available for this purpose.

Air Traffic Control

On-scene traffic safety will be maintained over a common traffic advisory frequency (CTAF). Pilots shall give periodic position reports, monitor the appropriately designated frequency for advisories, and establish visual contact with separation from other traffic. All flights shall be conducted in accordance with a Notice To Airmen (NOTAM). Operations at airports with a tower will use frequencies assigned by the Federal Aviation Administration (FAA) to that tower. Alyeska-owned towers will report arrivals and departures to the EOC.

Air Operations Assigned Channels

Air-to-ground communications for Alyeska-contracted helicopters to field task forces will be on an assigned “Operations” or “Task Force” channel. Flight following and helicopter tasking will be from the MCP Dispatcher to Air Operations Director, if assigned. Specific sets of aircraft radio frequencies available in the MCP will be used during an incident. For initial response and small incidents, ARTS channels may be used for air-to-ground communications and flight following and tasking will occur directly from the response base.

Medical Emergency

In the event of a medical emergency on the pipeline, initial request and response will be on standard pump station/response base Alyeska Radio-Telephone System (ARTS) frequencies.

TABLE 1-6 ALYESKA EMERGENCY OIL SPILL COMMUNICATION PLAN*

This communication plan is programmed as Zone 5 for all Alyeska handheld and mobile radios.

Selector #	Channel #	Channel Name	Channel Assignment	Location	Transmit Frequency	Receive Frequency	PL Code	PL Freq.	Call Sign
(b) (7)(F), (b) (3)									

TABLE 1-6 (CONTINUED) ALYESKA EMERGENCY OIL SPILL COMMUNICATION PLAN*

Selector #	Channel #	Channel Name	Channel Assignment	Location	Transmit Frequency	Receive Frequency	PL Code	PL Freq.	Call Sign
(b) (7)(F), (b) (3)									

** The Alyeska Mobile Command Post contains all these frequencies for Command & Control of an Incident.*

1.4.4 Telecommunications: Systems and Equipment

This section describes oil spill response telecommunications equipment for emergency use. A complete listing of contingency communications equipment is provided in Volume 1, Section 3.6.

1.4.4.1 Telecommunications Control Consoles

(b) (7)(F), (b) (3)

1.4.4.2 Radio Systems

(b) (7)(F), (b) (3)

1.4.4.3 Handheld Radios

(b) (7)(F), (b) (3)

1.4.4.4 Vehicle-Mounted Mobile Radios

(b) (7)(F), (b) (3)

1.4.4.5 Supplementary Systems

State of Alaska Emergency Telecommunications System

(b) (7)(F), (b) (3)

Alaska Clean Seas

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Data Network

(b) (7)(F), (b) (3)

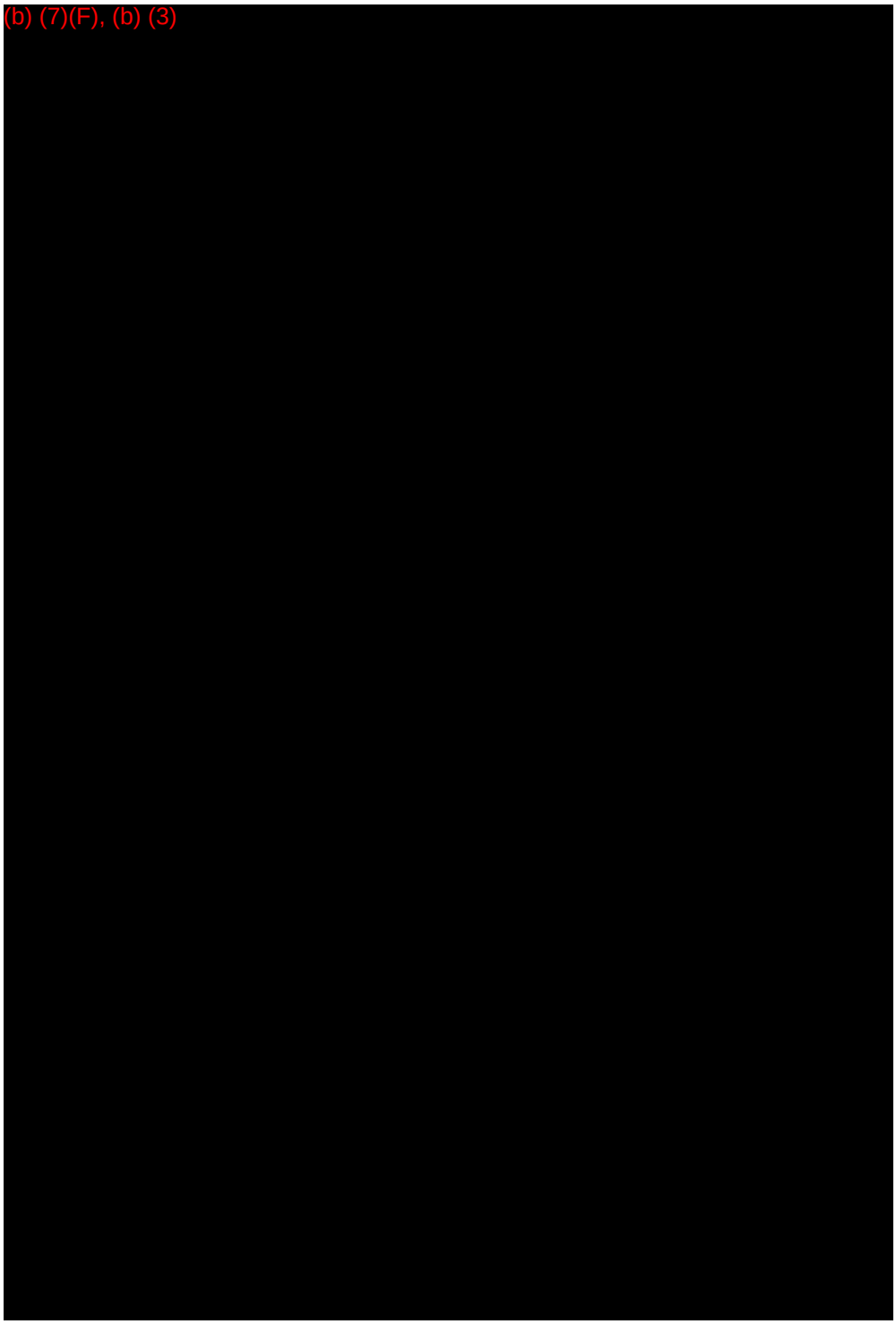


FIGURE 1-7 ALYESKA EMERGENCY TELECOMMUNICATIONS SYSTEMS

1.5 DEPLOYMENT STRATEGIES [18 AAC 75.425(e)(1)(E)]

(b) (7)(F), (b) (3)



1.5.1 Initial Response Teams (IRTs)

Alyeska maintains teams of trained response personnel at each of seven response centers or field bases (not including Valdez) (see Table 1-7). These teams are designated as the Initial Response Team (IRT) for incidents in their operating area and are made up of Alyeska and contractor personnel. The team is led by a RBS, P&CM, or an OC with equivalent oil spill response training and authority. The operating areas (geographic areas of responsibility) are as follows:

Prudhoe Response Base	PLMP 0.0 – 84.2
Galbraith Maintenance Base	PLMP 84.2 – 208.4
Prospect Response Base	PLMP 208.4 – 310.5
Yukon Response Base	PLMP 310.5 – 390.5
Fairbanks Response Base (PS07/PS08)	PLMP 390.5 – 495.6
Delta Response Base (PS09)	PLMP 495.6 – 647.3
Glennallen Response Base	PLMP 647.3 – 800

Alyeska has assigned five (10 positions) P&CMs (Prudhoe Response Base, Galbraith Maintenance Base, Yukon Response Base, Prospect Response Base, Delta Response Base, and Fairbanks Response Base), two (4 positions) RBSs (Yukon Response Base and Glennallen Response Base) and three OC (6 positions) so that three of these personnel are north of the Yukon River and three south of the Yukon River at all times.

This group of P&CMs, RBSs and OCs are qualified to perform or direct activities in the following areas.

- Reconnaissance
- Response Equipment and Personnel Mobilization
- Control and Containment of Spills on Land and Water
- Recovery and Storage of Spilled Products

- Spill Site Safety
- Communications Systems
- Incident Command System Roles and Responsibilities
- Use of the Oil Spill Contingency Plan and Requirements

In addition to the IRTs at response bases, Valdez (SERVS) and Fairbanks, Alyeska maintains Response Action Contracts (RACs) with organizations including:

- Ahtna Construction
- Arctic Slope Regional Corporation (ASRC) Energy Services — Houston Contracting Company, Inc. (HCC)
- Tatitlek Chenega Chugach, LLC (TCC)
- Alaska Clean Seas (ACS)

These contracts spell out the number of personnel available for support and response equipment availability.

More information on the RACs is presented in Volume 1, Section 3.8.

Alyeska will maintain 69 initial responders at all times, regardless of how shifts and schedules are managed. Table 1-7 shows the composition of the IRTs, which are typically made up of Baseline crew members, pipeline P&CMs and/or OCs.

Examples of how a tiered response would bring adequate personnel resources on-line at the scene of an incident are provided in *Volume 2, Scenarios.*

TABLE 1-7 INITIAL RESPONSE TEAMS

Facility	Initial Responders			P&CM	RBS	OC[4]
	Baseline[1]	Other Responders[2]	Total Initial Responders[3]			
PS01/Prudhoe	3	7	10	1	0	1
PS04/Galbraith	4	6	10	1	0	0
PS05/Prospect	3	4	7	1	0	0
PS06/Yukon	3	0	3	0	1	0
Fairbanks	3	13	16	1	0	1
Delta	3	2	5	1	0	0
PS11/Glennallen	7	3	10	0	1	1
SERVS[5]	0	8	8	0	0	0
TOTAL	26	43	69	5	2	3

[1] Baseline requirement is one crew per facility and two crews at Glennallen (with a Superintendent). Each crew is comprised of teamsters, operators, and laborers.

[2] Other responders are made up of technicians, mechanics, and Fairbanks Fabrication Facility personnel (6). In the Fairbanks area, other responders also include the Fairbanks Extended Urban team.

[3] Total Initial Responders [(1) + (2)] do not include P&CM, RBS or OC. RBS, P&CM/OC commitment is three north and three south of the Yukon River at all times.

[4] OCs cover multiple areas (North, Central, and South) and are not counted as Initial Responders.

[5] SERVS – This IRT is comprised of 8 trained responders from one of Alyeska's primary response action contractors (PRACs) and is typically led by a SERVS response coordinator. The 8-person IRT is selected from a pool of responders (approximately 20 per shift) and this pool contains multiple operators, laborers, and teamsters.

1.5.2 Transportation [18 AAC 75.425(e)(1)(E)(i)]

1.5.2.1 Surface Transportation

Alyeska maintains or rents a fleet of light duty and heavy duty trucks, track vehicles, boats, barges, and buses that could be used for transport of personnel on land or water. Personnel would be directed to report to a central staging area for briefings and assignment to transportation.

If an oil spill event occurs along the pipeline, equipment and personnel from the nearest station and adjoining stations or facilities would travel via road or the pipeline right-of-way (ROW) to the incident scene.

Tables 1-8 through 1-10 show the highway distances between Alyeska facilities and average travel speeds for adverse, average, and good weather conditions.

Alyeska's surface transportation assets are described in Volume 1, Section 3.5, "Logistical Support," and Section 3.6, "Response Equipment."

1.5.2.2 Air Transportation

Alyeska has ready access to various types of fixed-wing commercial passenger aircraft, cargo aircraft, and helicopters. Commercial airports, capable of handling large passenger and cargo aircraft, are located at Prudhoe Bay, Fairbanks, Delta, and Valdez. Additionally, Alyeska operates airports at Galbraith Lake and Prospect Creek along the pipeline ROW.

Alyeska's air transportation assets are described in Volume 1, Section 3.5, "Logistical Support," and Section 3.6, "Response Equipment."

1.5.2.3 Water Transportation

Alyeska owns and maintains a fleet of workboats at locations from PS01 to Valdez for use in transporting personnel and equipment via water on rivers, lakes, and bays.

Alyeska's water transportation assets are described in Volume 1, Section 3.5, "Logistical Support," and Section 3.6, "Response Equipment."

1.5.2.4 Transport During Adverse Weather Conditions

Certain weather or environmental conditions may affect the mobilization of personnel and equipment. Alternative travel modes or equipment may be used to overcome these conditions to allow the response actions to proceed. Examples of these conditions and alternatives are listed below.

1. When roads are snow covered to the extent that normal, four-wheel drive pickup trucks cannot pass.

   This described condition can be overcome by using Tucker track vehicles, Bombardier or similar track vehicles, and snow machines for personnel and limited equipment transport if the conditions

do not constitute a life safety threat. Semi tractors, trailers, and flatbed trucks with higher ground clearance could still proceed to spill site.

2. When roads are slippery from ice and snow such that heavy equipment has difficulty on grades.

   This described condition can be overcome by using tire chains on all drive wheels, using push trucks with special bumpers to assist, calling the various State of Alaska Department of Transportation Highway Maintenance Camps requesting road sand/gravel for a specific area, or using heavy equipment such as road graders, front end loaders, and dozers to pull the vehicles up a grade.

3. When access roads are snow covered to the extent that normal vehicles cannot pass.

   This condition could be overcome by using track vehicles and snow machines.

4. When access roads are wet and soft.

   This described condition occurs at spring breakup. Restrictions are put in place to protect the access roads from unnecessary damage. In an actual event, these restrictions would be lifted in order to access the spill site. If a piece of equipment became stuck for any reason, the available heavy equipment would be used to tow it to the spill site or through the soft area. Any damage to the access road would be repaired post-incident.

5. When aircraft are grounded.

   Travel to the spill under these conditions would be by surface via trucks, buses, and boats.

6. When containment sites are off the road system and the ground is soft.

   Travel under these conditions could be accomplished by helicopter, track vehicle, or all-terrain vehicles.

The time to move heavy equipment requiring transportation by trailer or lowboy will vary based on the type of equipment, time of year, and whether or not the equipment is maintained in warm storage. A worst case example of the time required to commence transportation of a piece of heavy equipment is described below.

In cold temperatures, for equipment in cold storage, up to 2 hours could be required to heat the equipment prior to starting it. The purpose of heating is to ensure that the hydraulic fluid will flow readily and not blow out seals or hydraulic lines and render the equipment inoperable. An additional hour may be required to load the equipment onto a lowboy trailer and ensure that the appropriate number of boosters (extra axles) are in place to haul the weight.

In some situations, personnel may have to be dispatched to a ramped down pump station to mobilize a piece of equipment. Table 1-11 provides road mileage between pump stations/response bases.

While in most instances equipment and personnel will travel by road and the ROW to the spill scene, some personnel and equipment may be transported by helicopter or vessel.

TABLE 1-8 TRAVEL TIME IN HOURS IN ADVERSE WEATHER CONDITIONS (15 MPH)

	Prudhoe Response Base	PS02	PS03	Galbraith Maintenance Base	Prospect Response Base	Yukon Response Base	PS07	FBK	PS08	Delta Response Base	PS10	Glennallen Response Base	PS12	VDZ
Prudhoe Response Base		4.4	7.5	10.3	19.2	24.7	30.3	34	36.7	41	43.7	50.9	54	58.5
PS02	4.4		3	5.9	14.8	20.3	25.9	29.6	32.3	36.6	39	46.5	49.6	54.1
PS03	7.5	3		2.8	11.7	17.3	22.8	26.5	29.2	33.5	36.2	43.5	46.5	51.1
Galbraith Maintenance Base	10.3	5.9	2.8		8.9	14.5	20	23.7	25.7	30.7	33.4	40.7	43.7	48.3
Prospect Response Base	19.2	14.8	11.7	8.9		5.5	11.1	14.8	17.5	21.8	24.5	31.7	34.8	39.3
Yukon Response Base	24.7	20.3	17.3	14.5	5.5		5.6	9.3	11.9	16.3	18.9	26.2	29.3	33.8
PS07	30.3	25.9	22.8	20	11.1	5.6		3.7	6.3	10.7	13.3	20.6	23.7	28.2
FBK	34	29.6	26.5	23.7	14.8	9.3	3.7		2.7	7	9.7	16.9	20	24.5
PS08	36.7	32.3	29.2	25.7	17.5	11.9	6.3	2.7		5.3	7.9	15.2	18.3	22.8
Delta Response Base	41	36.6	33.5	30.7	21.8	16.3	10.7	7	5.3		2.7	9.9	13	17.5
PS10	43.7	39	36.2	33.4	24.5	18.9	13.3	9.7	7.9	2.7		7.3	10.3	15.5
Glennallen Response Base	50.9	46.5	43.5	40.7	31.7	26.2	20.6	16.9	15.2	9.9	7.3		3.6	8.1
PS12	54	49.6	46.5	43.7	34.8	29.3	23.7	20	18.3	13	10.3	3.6		4.5
VDZ	58.5	54.1	51.1	48.3	39.3	33.8	28.2	24.5	22.8	17.5	15.5	8.1	4.5	

TABLE 1-9 TRAVEL TIME IN HOURS IN AVERAGE WEATHER CONDITIONS (35 MPH)

	Prudhoe Response Base	PS02	PS03	Galbraith Maintenance Base	Prospect Response Base	Yukon Response Base	PS07	FBK	PS08	Delta Response Base	PS10	Glennallen Response Base	PS12	VDZ
Prudhoe Response Base		1.9	3.2	4.4	8.2	10.6	13	14.6	15.7	17.6	18.7	21.8	23.1	25
PS02	1.9		1.3	2.5	6.3	8.7	11.1	12.7	13.8	15.7	16.7	19.9	21.3	23.2
PS03	3.2	1.3		1.2	5	7.4	9.8	11.4	12.5	14.4	15.5	18.6	19.9	21.9
Galbraith Maintenance Base	4.4	2.5	1.2		3.8	6.2	8.6	10.2	11	13.1	14.3	17.4	18.7	20.7
Prospect Response Base	8.2	6.3	5	3.8		2.4	4.8	6.3	7.5	9.3	10.5	13.6	14.9	16.9
Yukon Response Base	10.6	8.7	7.4	6.2	2.4		2.4	4	5.1	7	8.1	11.2	12.5	14.5
PS07	13	11.1	9.8	8.6	4.8	2.4		1.6	2.7	4.6	5.7	8.8	10.1	12.1
FBK	14.6	12.7	11.4	10.2	6.3	4	1.6		1.1	3	4.1	7.3	8.6	10.5
PS08	15.7	13.8	12.5	11	7.5	5.1	2.7	1.1		2.3	3.4	6.5	7.8	9.8
Delta Response Base	17.6	15.7	14.4	13.1	9.3	7	4.6	3	2.3		1.1	4.3	5.6	7.5
PS10	18.7	16.7	15.5	14.3	10.5	8.1	5.7	4.1	3.4	1.1		3.1	4.4	6.7
Glennallen Response Base	21.8	19.9	18.6	17.4	13.6	11.2	8.8	7.3	6.5	4.3	3.1		1.5	3.5
PS12	23.1	21.3	19.9	18.7	14.9	12.5	10.1	8.6	7.8	5.6	4.4	1.5		1.9
VDZ	25	23.2	21.9	20.7	16.9	14.5	12.1	10.5	9.8	7.5	6.7	3.5	1.9	

TABLE 1-10 TRAVEL TIME IN HOURS IN GOOD WEATHER CONDITIONS (50 MPH)

	Prudhoe Response Base	PS02	PS03	Galbraith Maintenance Base	Prospect Response Base	Yukon Response Base	PS07	FBK	PS08	Delta Response Base	PS10	Glennallen Response Base	PS12	VDZ
Prudhoe Response Base		1.3	2.2	3.1	5.8	7.4	9.1	10.2	11	12.3	13.1	15.3	16.2	17.6
PS02	1.3		0.9	1.8	4.4	6.1	7.8	8.9	9.7	11	11.7	14	14.9	16.2
PS03	2.2	0.9		0.8	3.5	5.2	6.9	8	8.8	10.1	10.9	13	14	15.2
Galbraith Maintenance Base	3.1	1.8	0.8		2.7	4.3	6	7.1	7.7	9.2	10	12.2	13.1	14.5
Prospect Response Base	5.8	4.4	3.5	2.7		1.7	3.3	4.4	5.2	6.5	7.3	9.5	10.4	11.8
Yukon Response Base	7.4	6.1	5.2	4.3	1.7		1.7	2.8	3.6	4.9	5.7	7.9	8.8	10.1
PS07	9.1	7.8	6.9	6	3.3	1.7		1.1	1.9	3.2	4	6.2	7.1	8.5
FBK	10.2	8.9	8	7.1	4.4	2.8	1.1		0.8	2.1	2.9	5.1	6	7.4
PS 8	11	9.7	8.8	7.7	5.2	3.6	1.9	0.8		1.6	2.4	4.6	5.5	6.8
Delta Response Base	12.3	11	10.1	9.2	6.5	4.9	3.2	2.1	1.6		0.8	3	3.9	5.3
PS10	13.1	11.7	10.9	10	7.3	5.7	4	2.9	2.4	0.8		2.2	3.1	4.7
Glennallen Response Base	15.3	14	13	12.2	9.5	7.9	6.2	5.1	4.6	3	2.2		1.1	2.4
PS12	16.2	14.9	14	13.1	10.4	8.8	7.1	6	5.5	3.9	3.1	1.1		1.4
VDZ	17.6	16.2	15.2	14.5	11.8	10.1	8.5	7.4	6.8	5.3	4.7	2.4	1.4	

TABLE 1-11 ROAD MILEAGE CHART

	Prudhoe Response Base	PS02	PS03	Galbraith Maintenance Base	Prospect Response Base	Yukon Response Base	PS07	FBK	PS08	Delta Response Base	PS10	Glennallen Response Base	PS12	VDZ	Anch
Prudhoe Response Base		66	112	154	288	371	455	510	550	615	655	764	810	878	874
PS02	66		46	88	222	305	389	444	484	549	585	698	744	812	808
PS03	112	46		42	176	259	343	398	438	503	543	652	698	766	762
Galbraith Maintenance Base	154	88	42		134	217	301	356	386	461	501	610	656	724	720
Prospect Response Base	288	222	176	134		83	167	222	262	327	387	476	522	590	588
Yukon Response Base	371	305	259	217	83		84	139	179	244	284	393	439	507	503
PS07	455	389	343	301	167	84		55	95	160	200	309	355	423	519
FBK	510	444	398	356	222	139	55		40	105	145	254	300	368	384
PS08	550	484	438	386	262	179	95	40		79	119	228	274	342	404
Delta Response Base	615	549	503	461	327	244	160	105	79		40	149	195	263	326
PS10	655	585	543	501	367	284	200	145	119	40		109	155	223	286
Glennallen Response Base	764	698	652	610	476	393	309	254	228	149	109		54	122	185
PS12	810	744	698	656	522	439	355	300	274	195	155	54		68	235

TABLE 1-11 (CONTINUED) ROAD MILEAGE CHART

	Prudhoe Response Base	PS02	PS03	Galbraith Maintenance Base	Prospect Response Base	Yukon Response Base	PS07	FBK	PS08	Delta Response Base	PS10	Glennallen Response Base	PS12	VDZ	Anch
VDZ	878	812	766	724	590	507	423	368	342	263	233	122	68		299
Anch	874	808	762	720	586	503	419	364	404	326	286	185	235	299	
	Mileage via Parks Highway									Mileage via Glenn and Richardson Highways					

Note: *Estimated travel speed in adverse weather conditions is 15 mph.*
Estimated travel speed in average weather conditions is 35 mph.
Estimated travel speed in good weather conditions is 50 mph.
Anch – Anchorage
FBK – Fairbanks
RB –Response Base
VDZ - Valdez

1.5.3 Procedures to Notify and Mobilize Response Action Contractors [18 AAC 75.425(e)(1)(E)(ii)]

Copies of Statements of Contractual Terms can be found in Volume 1, Section 3.8, “Primary Response Contractor Information.” Response action contractors are mobilized as needed to augment Alyeska’s internal response personnel or equipment resources. The decision to mobilize all or part of a response action contractor’s resources is determined based on the anticipated complexity or duration of the response and not solely on the volume of the spill. A call to one or more of the contractors is made at the direction of the Initial Incident Commander or the Incident Commander.

Contractor personnel and equipment will work under the direction of the Operations Section chain of command, normally filled by an Alyeska employee. No transfer of response duties from an Alyeska employee to a response contractor employee will occur without the knowledge of the Unified Command State and Federal On-Scene Coordinators.

Response action contractor personnel will remain employed on the incident until no longer needed. Decisions to demobilize the response action contractors are made under the Alyeska Incident Management Team/Incident Command System processes.

Alyeska maintains contracts with four oil spill response service providers considered to be response action contractors. Activation of these contractors is accomplished by calling the listed contact numbers.

Alaska Clean Seas (Ron Hocking) Pouch 340022 Prudhoe Bay, Alaska 99734 (907) 659-2405 (24 hours)	The basis of the contract is for access to Alaska Clean Seas (ACS) spill response equipment and personnel for incidents occurring along the first 205.5 miles of pipeline. ACS may be used beyond the geographic limit at the discretion of the ACS General Manager.
Ahtna Construction PO Box 649 Glennallen, Alaska 99588 (907) 822-3561 or Alyeska ext. 5117 Additional contact numbers: Sue Taylor work: (907) 771-5307 cell: (b) (6)	The basis of the contract is for a minimum of two, seven-person crews based at the Glennallen Response Base working weeks-on and two weeks-off to respond to incidents. Primary area of coverage is between PLMP 647.3 and PLMP 800. Response equipment is supplied by Alyeska. Scott McIllroy work: (907) 771-5307 cell: (b) (6)
TCC - A Joint Venture Peter Anderson, President CASI (907) 563-8866 Fred Berdahl, Project Manager, TCC	The basis of the contract is to provide spill response personnel as members of an eight person SERVS team for response to an incident between Valdez and PS12. Response equipment is supplied by Alyeska.
ASRC Energy Services - Houston Contracting, Inc. Wade Blasingame, President/Gen. Mgr. (907) 339-6412 3900 C Street Anchorage, AK 99503	The basis of the contract is to provide a baseline crew at each on-line pump station and at the Yukon, Fairbanks, and Delta Response bases. This contract also provides vehicle maintenance and equipment shop personnel as well as welding and pipe fitting personnel for the Alyeska Fabrication (Fab) Shop in Fairbanks. Response equipment is supplied by Alyeska.

1.5.4 Equipment Locations

Oil spill reconnaissance, response, and recovery equipment is located at response bases, on- and off-line pump stations, Valdez/SERVS, Alaska Clean Seas, Prudhoe Bay, and at strategic cache sites adjacent to and off the pipeline ROW. Response equipment is packaged for ease of mobilization.

In the event of an RPS-volume spill, the ICS Logistics Section, working with the Operations and Planning sections, would immediately begin requesting and making arrangements for moving equipment to the scene of the incident.

Depending on the magnitude of the incident, it is anticipated that equipment nearest the location would mobilize and arrive on scene first. Equipment furthest away from the incident would mobilize within the first hours of the event and arrive last due to travel time. Incident staging areas will handle arriving equipment and dispatching it to the scene.

A complete listing of Alyeska's oil spill equipment is provided in Volume 1, Section 3.6.

1.5.5 Mobilization and Response Times

The first response resources to arrive on the scene of an incident would probably be from the closest pump station/response base or other Alyeska facility (Fairbanks, Glennallen, or Valdez). To minimize mobilization and response times, initial response equipment at each pump station/response base is pre-loaded in the 26' summer, 26' winter, and 45' trailers and is kept warm during winter months.

1.5.6 Personnel

Alyeska personnel and contractors are available to respond to a spill from PS01 to the Valdez Terminal/Prince William Sound. The Incident Management Team/ICS Personnel Unit Leader will handle requests for personnel to supplement on-scene resources. Transportation of personnel may be by land, air, or water depending on the incident location.

Form 10800, "IRT Personnel Form," available in Outlook, tracks Alyeska and contractor personnel available for immediate spill response at each facility. This form is reviewed daily by the P&CM or RBS responsible for that area. See Section 1.2.2.1 for form location information.

EPC-001, Completing and Retaining Form 10800-x, IRT Personnel Form (series), outlines the steps required to complete and retain a daily roster of IRT members for each pump station/response center on the site-specific 10800 form.

In addition, *EPC-002, Fairbanks Response Base Emergency Response Notification,* provides the method for contacting emergency responders for the Fairbanks Response Base at any time during the day or night in the event of an oil spill or other actual or threatened emergency requiring Fairbanks response personnel.

1.6 RESPONSE STRATEGIES [18 AAC 75.425(e)(1)(F)]

In accordance with 18 AAC 75.425(e)(1)(F), Alyeska has prepared descriptions of hypothetical spill incidents and responses that demonstrate Alyeska's ability to respond to a discharge of each applicable RPS volume within the required time frames using the resources described in the contingency plan. These response scenarios are in *Volume 2, Scenarios*. The scenarios describe equipment, personnel, strategies, and tactics for planning purposes only and are neither a performance standard indication nor a guarantee of performance.

1.6.1 Procedures to Stop Discharge and Spread

1.6.1.1 Pipeline Shutdown for Leak in Pipeline

(b) (7)(F), (b) (3)

The Oil Movements Specialist (Controller) in the OCC will perform the actions needed to stop a pipeline discharge. *OCC-3.09, Known or Suspected Leaks or Spills (Abnormal Operating Condition),* details flow stoppage and valve closure for the pipeline system. The procedures are summarized here.

- If a leak is detected and verified as actual or probable:
  - Idle pump stations upstream of leak location.
  - Initiate a Close Remote Gate Valves command to the station upstream of the suspected spill area.
  - Evaluate the necessity of shutting down the remainder of the pump stations downstream of the spill site after the RGVs are closed.
- Depending on the location of the leak and the pipe elevation profile, it may be possible in some limited conditions to reduce the amount of oil spilled by:
  - Closing upstream valves.
  - Holding downstream valves open.
  - Continuing to operate the downstream pump station pumps until they trip offline due to low suction pressure.
- Leaving upstream valves open to attempt to backflow oil to an upstream pump station relief tank is an even more limited option because check valves prevent backflow.

1.6.1.2 Temporary Patching/Repair/Isolation

Alyeska maintains a variety of clamps and sleeves for emergency patching or repair to stop a leak.

Repair Clamps:

Clamps for each size of crude oil piping that is in service are strategically positioned along the pipeline for ready deployment.

Bullet Hole Clamps:

A steel band with an attached Buna-N, rubber-type cone that is strapped around the pipe with the cone pointed toward (or in) the hole.

Flange Leak Clamps:

Maintained for all crude oil piping sizes. The system consists of a bolted clamp ring, stainless steel sealing elements at the joints, and a sealant, which is injected into the cavity of the clamp that seals the leak within the stainless steel elements.

Buckle Sleeves:

Designed and fabricated by Alyeska for encapsulating a buckle in the 48-inch mainline pipe.

48-Inch Pipeline Clamp:

Hydraulically operated 48-inch pipeline clamps have applications similar to hand-operated mechanical clamps.

Valve Bypass Piping:

Leaks developing on mainline valve bypass piping can be controlled by closure of the isolation valves on either side of the mainline valve.

1.6.1.3 Pump Station Tankage and Piping

Leaks from pump station tankage could result from mechanical damage to the tank shell or fittings, seal or gasket failure, or undetected corrosion penetration of tank bottom, shell, or associated piping. Actions to stop a discharge will involve:

- Isolating flow into the affected tank until the source is specifically determined.
- Gravity-flowing product into an adjacent lower-level tank if possible to empty affected tank.
- Pumping down affected tank to below leak point.
- If damaged piping is the source, closing valves on either side of leak to isolate and minimize spillage.
- When safe to do so, installing temporary patch or tightening flanges at source of leak.

Tank drawings and piping diagrams for facilities are readily available on site for use in determining leak sources and isolation requirements. Additional information on damaged tank transfers can be found at "Damaged Storage Tank Transfer Procedures" in Volume 3, Section 4.4.

1.6.1.4 Pipeline Valves - Internal Leakage

The valves in Table 1-12 show detectable internal leakage past the valve seat, but within the performance criteria limits of *P-504, In-Service Criteria: Primary Crude Block Valves*.

TABLE 1-12 VALVE LEAK-THROUGH MEASUREMENTS

Valve	Measured Leak-Through (square inches)	Acceptable Leak-Through (square inches)
(b) (7)(F), (b) (3)	0.32	0.50
	0.19	0.88
	0.02	1.28
	0.008	0.61
	0.02	0.66
	0.02	2.17
	0.12	0.54
	<0.5	1.17
	0.0016	0.26
	0.00681	0.72
	0.18	1.00
	0.01	0.68

The normal segment isolation procedures may be modified for small leaks in adjacent pipeline segments. Those modified procedures are described in *OCC-3.09, Known or Suspected Leaks or Spills (Abnormal Operating Condition).*

1.6.2 Methods to Prevent or Control Potential Fire Hazards

To prevent ignition of vapors and liquids, responders must be extremely cautious when approaching or working near large quantities of spilled oil. First responders must conduct a site characterization using the "Site Safety and Control Analysis" (Form ICS 201-5) and will list safe work areas, personal protective equipment (PPE), and ongoing vapor monitoring requirements. Only personnel trained in gas testing will complete this form.

Key actions to prevent ignition include, but are not limited to:

- Establish wind direction at scene for safe areas of approach to the spill for containment and recovery equipment operations.
- Take hydrocarbon vapor readings at spill scene to determine vapor levels at lower explosive limit (LEL).
- Establish cold, warm, and hot zones. Mark and diagram for responders.
- Restrict access to spill site and control response activities and general public near spill.
- Restrict motorized equipment and vehicle placement/access to safe work areas at spill site.
- De-energize electrical and open-flame equipment in the high-vapor areas.

1.6.2.1 Vapor Suppression

To suppress crude oil vapors, firefighting foam can be applied to the surface of pooled oil. Note that large volumes of foam are not generally available at pump stations, access for fire trucks may be limited, and water availability for foam making may be limited along the pipeline ROW. Consult with the S/IH Specialist to determine the most prudent course of action.

Favorable conditions for use of firefighting foam include:

- It is not raining. Rain will break down foam blanket over time.
- Winds are less than 5 miles per hour. Stronger winds will break up the continuous foam blanket causing holes to appear.
- The spilled oil is in a standing pool. Foam cannot be applied to flowing oil.
- The oiled area of interest is, or nearly is, level. Foam applied to a slope will run to the lowest area.
- Fire foam will be needed for vapor suppression for only a short time. Fire foam will deteriorate and holes will open in the foam blanket.

Foaming of large amounts or areas of pooled oil for vapor suppression is possible but must be carefully considered in the context of the incident. More proactive measures, such as isolating power supplies if circuits are damaged and establishing hazard zones to control equipment placement, provide more predictable results in preventing ignition of spilled oil vapors.

Foam application inside pump station facilities is more practical given the fixed systems available, water supply, and foam supplies.

Resources

There are Airfield Rescue and Fire Fighting (ARFF) trucks, one each, at Galbraith Maintenance Base/PS04 and Prospect Response Base/PS05. There are (b) (7)(F), of fire foam concentrate in a storage tank connected to the pump station's fixed fire water/foam system and another (b) (7)(F), of fire foam in reserve at each active pump station.

There are (b) (7)(F), (b) of fire foam concentrate available for immediate transport via a tank trailer from the Valdez Marine Terminal.

There is no fire truck assigned to the Yukon Response Base. Vapor suppression equipment is available from the PS05 ARFF truck and the Source Control Tri-Max skids in Fairbanks. Potential fire hazards are prevented through area inspections, use of the work permit system, and work procedures. Fires are controlled using portable fire extinguishers (including wheeled units) following the response parameters of *EC-71-YRB, Emergency Contingency Action Plan, Yukon Response Base*.

Application

The application rate of AFFF fire foam for hydrocarbon fires is 0.10 gallons of 3% dilute foam solution per square foot of fire area for 10 minutes. For example, a 50-foot by 50-foot fire area at an application ratio of 3% foam solution would require 75 gallons of foam concentrate and 2,425 gallons of water.

1.6.2.2 Fire Suppression and Control

If a fire occurs with an oil spill, the incident will be handled as a fire until it is extinguished or brought under sufficient control so as to not present an unmanageable hazard to oil spill response personnel.

Pipeline Right-of-Way

Responders to an oil spill incident on the pipeline ROW will have access to 20-lb dry-powder fire extinguishers. The handheld extinguishers are primarily intended for use on incipient fires and to protect life safety. If an area became fully involved in fire beyond the capability of local resources to control, assistance would be requested from the joint State of Alaska and U.S. Bureau of Land Management resources of the Alaska Fire Service (AFS). AFS personnel would respond to the wildland fire portion only. The Alaska Fire Service 24-hour contact number is (907) 451-2626.

Pump Stations

Fires occurring with spills at pump stations will be controlled/extinguished using both fixed and portable systems detailed in the site-specific pump station *EC-71, Emergency Contingency Action Plan,* which provides information and facility diagrams on the location and use of these systems:

- Fire-foam fixed systems
- CO_2 fixed systems
- Halon fixed systems
- Novec fixed systems
- Portable fire extinguishers

Section 4 of each plan contains information related to response to fires at pump stations. Text from that section is shown below to describe the general actions that would take place in the event spilled oil caught fire (Figure 1-8).

Response Bases

Fires occurring with spills at response bases will be controlled/extinguished using portable systems. Fire prevention measures include area inspections, work permit system, and work procedures. Firefighting (vapor suppression) equipment for responses bases is as follows:

- Prudhoe: Portable extinguishers including wheeled units, Fire trucks from BP.
- Galbraith: Portable extinguishers including wheeled units, ARFF truck.
- Prospect: Portable extinguishers including wheeled units, ARFF truck.
- Yukon: Portable extinguishers including wheeled units. Additional firefighting (vapor suppression) equipment is available from the PS05-assigned airport fire truck and the Source Control Tri-Max skids.
- Delta: Portable extinguishers including wheeled units.
- Glennallen: Portable extinguishers including wheeled units and a Tri-Max skid.

1.6.2.3 Electrical Isolation

Electrical systems are designed to prevent ignition of hydrocarbon vapors in oil-handling areas such as pump buildings, valve enclosures, and tank farm areas. Should these systems become damaged and create a potential ignition source, the systems can be isolated and de-energized. The location of the isolation switch gear is posted on a placard at the door of each building or enclosure.

Section 4. Spill/Gas/Fire in Specific Areas

4.1 Preliminary and General Information

NOTE

In the specific area plans which follow, some actions of emergency responders are characterized as priority or control actions.
PRIORITY actions are those actions considered for initial containment of a FIRE, SPILL, or LEAK.
CONTROL actions are actions considered to mitigate the emergency situation.

4.1.1 Discovery of Actual or Potential Fire/Spill/Leak

1. Based on employee's training and personal ability, determine what action may safely be taken.
   - Take appropriate, immediate action.
   - NOTIFY the Control Room Operator (CRO) and request direction.

EXAMPLE

A situation discovered by an Operation's Technician, combined with that employee's training and ability, may call for the Technician to perform one of the following:

- Manually CLOSE appropriate Isolation Valve.
- Initiate emergency SHUTDOWN (ESD BUTTON).
- Dump HALON via the manual HALON pull station while egressing.
- The Technician must always contact the CRO.

2. If the SOURCE cannot be ISOLATED safely, egress at once to a safe area, report the situation to the CRO, and wait for instructions.
3. Regardless of any actions to ISOLATE the SOURCE, report all emergencies to the CRO according to Section 2.1, "Preferred Means for Reporting Emergencies," on page 2-1. If a radio or telephone is used to report the emergency, state the following:

"Control, this is an emergency." (Repeat once.)
State EMERGENCY (e.g., fire, explosion, oil spill, injured person), the **location**, and **your name**.

4. Personnel response will be appropriate to individual training and available equipment.

4.1.2 Evaluating and Responding to Fires and Spills

If Operations & Maintenance Supervisor/IC (O&M) judges the fire to be beyond the incipient stage as defined below, they will determine further actions to be taken, such as activating fixed systems, shutting down/isolating equipment and utilities from outside the hot zone, and evacuating when necessary.

FIGURE 1-8 GENERAL ACTIONS (PART 1 OF 4) (SOURCE: EC-71-01)

Analysis of Hazards for Fires and Spills	Response actions will generally be the same. The difference lies in that spills are potential fires. Actions to prevent ignition take priority. The initial control action for a significant flammable liquids spill (gasoline and crude oil) is to consider foaming the area. The initial control action for a significant combustible liquids spill, such as a diesel or turbine fuel spill, is to consider factors present in the particular spill, including location, possible sources of ignition, and environmental considerations.
Chemical product: Any amount to land, air, or water	See *EN-43-007, Environmental Protection Manual: Spill Prevention, Reporting, and Cleanup*, for more information on spills and spill reporting.
Chemical product: Any volume to containment or inside buildings	See *EN-43-007, Environmental Protection Manual: Spill Prevention, Reporting, and Cleanup*, for more information on spills and spill reporting.
Flammable/Hazardous Materials in Area	Isolation of potential sources of fuel is one of the key responses in any fire or spill emergency.
Hot Zone	The area immediately surrounding the physical location of the fire, having a boundary that extends far enough from the fire to protect personnel positioned outside the hot zone from being directly exposed to flames, dense smoke, or extreme temperatures.
Incipient Fire	A fire that is in the initial stage and can be controlled or extinguished by portable extinguishers or small hose lines, and without the need to wear protective clothing or breathing apparatus, or take evasive action, such as crawling to avoid the smoke.
Major Spills	**Petroleum-based product:** More than 55 gallons to containment or inside buildings, more than 10 gallons to land, or any spill to water (18 AAC 75.300).
Minor Spills	**Petroleum-based product:** Less than 55 gallons to containment or inside buildings, or less than 10 gallons to land (18 AAC 75.300, "Discharge or Release Notification; Reporting Requirements").
Releases to Air	Releases of halon, propane, Freon, etc., are considered reportable, even if released for the purpose intended (e.g., halon for fire suppression). Additionally, the OCC must be contacted as soon as possible.See *EN-43-007* for more information.

4.1.3 Release of Hazardous Substances

Follow prescribed guidelines in the Appendix C, "RCRA Contingency Plan" when hazardous substances are released. All personnel responding must adhere to the personal protective equipment (PPE) requirements to avoid any human health risks that may be present at the emergency area. (refer to Appendix C, "RCRA Contingency Plan" and *SA-38, Corporate Safety Manual,* Section 1.6, "Personal Protective Equipment.")

FIGURE 1-8 GENERAL ACTIONS (PART 2 OF 4) (SOURCE: EC-71-01)

4.1.4 Gas/Fire Alarms and Actions at PS01

The Incident Commander is responsible for ensuring that all responding personnel are aware of the hazards involved in the release of hydrocarbons and that they take appropriate actions to safeguard health and property. See Appendix C for more information. Regulatory requirements for emergencies involving release of hydrocarbons are found in:

- *CP-35-1 Volume 1, Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan, Volume 1, Regulatory Volume*
- *EN-43, Environmental Protection Manual* series
- *OM-1, Procedural Manual for Operations, Maintenance and Emergencies*
- *SA-38, Corporate Safety Manual*

4.1.4.1 SR Special Commands-Cause & Effect Matrix

The most recent version of the PS1 Cause & Effect Matrix for SR equipment is available in the Alyeska database *TDDI* as drawing number D-31-E00685 SH 1.

FIGURE 1-8 GENERAL ACTIONS (PART 3 OF 4) (SOURCE: EC-71-01)

Figure 1. Detection Automatic Response Matrix

LOCATION	GAS NON-VOTED AREA		GAS VOTED AREA				FIRE				MANUAL PULL	
	20% LEL	50% LEL	60% LEL	One 20% LEL	Two 20% LEL	20% & 50%	20% & 60% LEL	IR/UV	THERM/AL	ION		
BP / Pig Receiver Module	3-6-17		3-6-17					1-7-17				
Booster Pump Bldg (BP)				3-6	2-4-5-8			1-3-4-5-7-8-17			1-3-4-5-7-8-17	1 HALON / NOVEC Discharge
Booster Turbine Bldg (BT)				3-6	2-4-5-8			1-3-4-5-7-8-17			1-3-4-5-7-8-17	2 Close Gas Valve(s)
Booster Turbine Enclosure (BU-1,2,3)	3-6		5-6					1-5-7-17			1-5-7-17	3 Start Emergency Ventilation
Communications/ LAN WAN Module										Voted 1-7-17	1-7-17	4 Close Liquid Fuel Valve(s)
Control Room (C)										Voted 1-7-10-17	1-7-10-17	5 Equipment Shutdown Command
Ellipse Room (WS)	2-6							2-4-7-16			2-4-7-16	6 Hazardous Atmosphere Alarm
Endicott Module Control Room										Voted 1-7-13-17	1-7-13-17	7 Stop Ventilation
Endicott Module Heater Room	2-6							1-2-5-7-13-17			1-2-5-7-13-17	8 Block Line/Isolate Pump House Command
Endicott Module Process Area				2-3-6				1-2-5-7-13-17			1-7-13-17	9 Isolate Station Command
Equipment Shop							1-2-5-8-7-13-17 (2@ 60)	1-2-7-13-17	2-5	2-5	1-2-5-7-17	10 Isolate Gas Building Command
FGCM Heater Room	2-5-6		2-5-6								1-2-5-7-17	11 Isolate Gas Building Command
FGCM Process Area	2-3-5-17	14				7-14-17-18		1-2-5-7-14-17			1-2-5-7-14-17	12 Isolate Lisburne Module Command
FGCM Control Room									1-7-17	Voted 1-7-17	1-7-17	13 Isolate Endicott Module Command
FGCM Compressor Enclosures (2,3)	2-5-17	5						1-5-7-17	1-5-7-17			14 Isolate/Blowdown FGCM Command
Flammable Liquids Bldg (FL)	6							1-7-17			1-7-17	15 Transfer to Liquid Fuel
Flare Shelter (VP)	3-6-17	7-18		3-6-17	2-5-11-14	7-18		1-2-7-11-14-17			1-7-17	16 Close Doors
Gas Building (G)			6								1-2-7-11-16-17	17 Activate Alarms and Strobes
Gas Mixing Skid	6									ALARM		18 Gas Venting Halon Discharge
Guard Shack / Security Building	6		6							Voted 1-7-17	1-7-17	
Hallways (6) (Halon in Manual)									2-4-5-7	2-4-5-7	2-4-5-7	
Incinerator Building									1-4-7-17	1-4-7-17	1-4-7-17	NOTE: Changes indicated in Blue
Lab										Voted 1-7-17	1-7-17	
LAN WAN Building										Voted 1-7-17	1-7-17	
Lifeline Generator Room (LL)			2-6-15	4				1-3-4-7-17	1-5-17		1-3-4-7-17	
Lifeline Generator Enclosures (G2A & G3A)	2-5-17	5						1-5-17			1-5-17	
Lisburne Module Control Room										Voted 1-7-12-17	1-7-12-17	
Lisburne Module Heater Room	2-6		2-6	2-3-6			1-2-5-8-7-13-17	1-2-5-7-13-17			1-2-5-7-13-17	
Lisburne Module Process Area				3-6	2-4-5-8		1-2-5-8-7-13-17 (2@ 60)	1-2-7-13-17			1-2-7-13-17	
Main Pump Room (P)				3-6	2-4-5-8			1-2-4-5-7-8-17			1-2-4-5-7-8-17	
Main Turbine Room (T)				3-6	2-4-5-8			1-3-4-5-7-8-17			1-3-4-5-7-8-17	
Main Turbine Enclosures (M1,U1,2,3)	3-6		5-6					1-5-7-17			1-5-7-17	
Meter Building (M)				3-6	8-9			1-7-8-9-17			1-7-8-9-17	
Meter Building Basement (MB)				3-6	8-9			1-7-8-9-17				
Office and Annex												
OSP Building									2	Alarm	Alarm	
PCP	2-4-5-6-7-16-17								2-4-5-7-16	2-4-5-7-16	2-4-5-7-16	
Primary Generator Enclosures (G1-A,B,C)	2-5-17	5						1-5-17	1-5-17		1-5-17	
Primary Generator Room (CG)				2-3-6-15	4-5			1-2-4-7-17			1-2-4-7-17	
Scraper Building (S)				3-6	8			1-7-8-17			1-7-8-17	
Solar Generator Enclosure - Primary (SAP)	6		4-5-6-17					5-17			5-17	Older Type UV Detectors remain Operational.
Solar Generator Enclosure - Lifeline (SAL)	6		4-5-6-17					5-17			5-17	Older Type UV Detectors remain Operational. See Section 4.28 for Emergency Response Actions
Substation Control Room				Second Floor				1-7-17		Voted 1, 7, 17	1, 7, 17	
Valve Shelter (VV)	3-6-17	7-18						1-7-17			1-7-17	
Vapor Recovery Building (VC)			3-6-17	2-5	7-18			1-3-5-7-17			1-3-5-7-17	
Vapor Recovery Storage								?			?	
Water Treatment and Garage (WGT)			2-6-7-16					2-7-16			2-7-16	

Note: When the alerting is bypassed in the control room a trouble alarm appears on the notifier. When the bypass is normalized in the control room the trouble changes to an Other and must be reset at the associated remote fire panel before it can be reset.
Note: The actions identified at each level are those that are triggered at that level. They do not include actions which are continuing from the previous level.

10/28/2011

FIGURE 1-8 GENERAL ACTIONS (PART 4 OF 4) (SOURCE: EC-71-01)

1.6.3 Real-Time Surveillance and Tracking of Spill on Land and Water

This section presents methods for real-time surveillance and tracking of discharged oil on land and water. A best available technology (BAT) evaluation of discharge tracking methods is provided in Section 4, "Best Available Technology Review."

The ability to predict how a crude oil spill will behave on land, water, snow and ice over time can increase the efficiency of control actions. This section discusses the following topics and their bearing on oil behavior:

- Physical Properties of Crude Oil
- Weathering and Degradation
- On Land Tracking and Predictions
- On Water Tracking and Predictions
- Post-Spill Oil Behavior

1.6.3.1 Physical Properties of Crude Oil

The chemical and physical characteristics of crude oil determine its toxicity, fouling characteristics, and biodegradability. Properties of environmental concern are viscosity, pour point, density, hydrogen sulfide content, benzene and initial boiling point. The first two properties are factors in determining the rate of spreading of a spill. Density helps to determine spill behavior in and near aquatic habitats, while hydrogen sulfide content, benzene, and flash point help to estimate safety hazards posed by an oil spill.

- Viscosity of oil, which is its resistance to an instantaneous change of shape, changes as a function of temperature and degree of weathering (evaporation) on both land and water. In general, viscosity decreases with increased temperature and increases with increased weathering.
- The pour point, or lowest temperature at which crude oil will flow, indicates a temperature below which the viscosity is so great as to inhibit spreading. It helps in predicting the physical behavior of a crude oil and in determining appropriate cleanup techniques.
- Density, as expressed by API gravity or specific gravity, is important in predicting spill or leak conditions near aquatic habitats, since it will affect the degree of mixing and the dispersion process. The density of the higher fractions of a crude oil (naphthalene, gas oil) also indicate the ultimate weathering product. Should these values be greater than that of water, the weathered oil could sink.
- The vapors from crude oil spills can pose various hazards to those exposed to the vapors through inhalation or skin absorption. The two vapors of primary concern are hydrogen sulfide and benzene. Hydrogen sulfide exposure of low (3 ppm) concentration can deaden the sense of smell in a few minutes, or in 60 seconds or less when exposed to higher (200+ ppm) concentrations. Breathing may stop after a few seconds of exposure to hydrogen sulfide concentrations greater than 600 ppm, with immediate loss of consciousness and subsequent death. Benzene is primarily an inhalation hazard. Systemic absorption may cause depression of the hematopoietic system, pancytopenia, aplastic anemia, and leukemia. High concentrations are irritating to the eyes and the mucous membranes of the nose and respiratory tract.

Total hydrocarbon vapors should be considered extremely flammable and the vapor may ignite explosively. While oil spilled in winter may in a very short time cool to a temperature where the vapors are no longer released to the atmosphere, any crude oil spill must be considered a potential fire hazard. All sources of flame must be kept upwind, and potential ignition sources removed from the vapor area.

Self-contained breathing apparatus (SCBA) respirators provide the only protection from hydrogen sulfide, while an organic vapor full mask (>50 ppm benzene) or organic vapor half mask (>10 ppm benzene) respirator will provide the necessary personal protection from crude oil vapors as long as hydrogen sulfide vapors are below 10 ppm. **Hydrogen sulfide vapors are not expected to be above 10 ppm as a result of any pipeline crude oil spill** (based on all past pipeline spills and the *Exxon Valdez* oil spill); however, there may be pocket concentrations of this gas in low lying areas and effective industrial hygiene vapor testing programs must be in effect at all times, and in all areas of the spill to properly detect all hazardous vapor concentrations.

1.6.3.2 Weathering and Degradation

Weathering (evaporation) and biodegradation are two natural processes that affect the behavior of an oil spill on a long-term basis. Upon exposure to air or water, fresh crude oil begins to evaporate and/or dissolve, starting with the light distillation fractions. It has been estimated that almost all components with a boiling point of less than 540°F are gone in a few days. North Slope crude oils are medium-weight crude oils and have evaporative losses measured at 20% to 40% at ambient temperatures above 32°F. Left behind are the heavy components of crude oil, which tend to be the least biodegradable and form the most stable water/oil emulsions.

Weathering slows when oil is absorbed or covered by snow, or when the surface area exposed to wind is otherwise reduced. As oil weathers, the density also increases. Both burning and sorbent effectiveness decrease with weathering, hampering containment and cleanup operations.

Biodegradation results from the breakdown of oil by microorganisms. This process is active in terrestrial and aquatic environments, and while the rate varies, it usually progresses more rapidly on land. As with weathering, the lighter fractions biodegrade quickly; the heavier components take more time. The rate of biodegradation decreases with decreasing temperatures and virtually stops with freezeup. However, it has been shown that careful application of fertilizer and tilling techniques may speed up biodegradation.

1.6.3.3 On Land Tracking and Predictions

The movement of oil over land depends primarily on the physical and chemical properties of the oil, local topography, soil permeability, and vegetative cover. The oil will follow the natural drainage patterns of the terrain downslope from the pipeline. In *The Physical Aspects of Crude Oil Spills in Northern Terrain,* MacKay et al. (1974) made the following observations and conclusions while studying several actual and experimental oil spills in northern Canada that could relate to oil spills that may occur along the trans-Alaska pipeline.

Local topography will most significantly control the shape of the oil flow and, thereby, the area extent of the spill. A spill on level terrain will tend to be circular in shape. A spill on a slope will tend to be elongated with a relatively short, advancing perimeter (leading edge) and little lateral movement. Downslope flow is primarily dependent on the hydraulic gradient and the leakage rate. When oil flow from the pipeline rupture has stopped, surface flow will slow and may stop.

Oil flowing over land can also infiltrate the vegetative and soil layers over which it flows. The rate of oil movement and its depth of penetration depend on many interrelated factors, including the viscosity and pour point of the oil, the permeability of the vegetation and soil, cohesive and adhesive forces between oil and soil or vegetation, and the location of the groundwater table or other aquifers. This subsurface flow can continue after surface flow has stopped, eventually affecting a larger subsurface area than the surface flow. Studies by MacKay et al. (1974) have shown that spills in taiga (northern) spruce-fir forest will flow horizontally and infiltrate vertically, saturating the surface organic layers. The rate of infiltration into taiga moss was rapid if low viscosity oil was spilled (10 centipoise at 150°F).

Oil will continue to spread until it reaches natural depressions or the sorbent nature and friction of the ground cover overcome the spreading force of the oil. The types of vegetation an oil spill encounters will affect its rate of flow and extent of spreading. A spill passing over relatively barren ground will flow and spread more rapidly than a spill on highly vegetated ground. Where a thick moss layer occurs with shrubs and/or trees, significant amounts of oil will be absorbed by the organic layer and will adhere to trees, shrubs, and other vegetation. MacKay et al., (1974) shows that a 1-foot organic layer can hold about 1 gallon of crude oil per square foot of subsurface. An equation has been developed to determine the steady state flow of oil on an inclined surface:

$Q = (pgWO^3 \text{ Sin } b) / (3u)$

or $O = (3uQ/ pgW \text{ Sin B } b)^{1/3}$

or $V = (pgO^2 \text{ Sin } b) / (3u)$

Where Q is the volumetric flowrate (ft^3 / sec)

p is the density (lb/ft^3)

g is the gravitational constant ($ft./sec^2$)

W is the flow width (ft)

O is the film thickness (ft)

b is the slope angle to the horizontal

u is the absolute viscosity (6.72×10^{-4} = lb/ft sec)

V is the average flow velocity (ft/sec)

Example:

Consider a spill of about 10,000 barrels over 1 hour, flowing on a slope of angle 5 degrees to the horizontal in an even flow of width 200 feet. Assume the oil viscosity is 17.1 centipoise, a typical value for Prudhoe Bay crude oil at 100°F.

$Q = 10{,}000$ bbl/hr = 2.8 bbl/sec = 15.89.6 ft^3/sec.

W = 200 ft

u = 17.1 centipoise = 1.15 × 10-2 lb/ft sec

g = 32 $ft./sec^2$

p = 55.8 lb/ft^3

Sin 5 degrees = 0.087

Substituting gives a film thickness of 0.31 inch moving at an average velocity of about 3.0 ft/sec.

Oil will spread over a relatively flat surface until the forces of gravity and inertia are balanced by surface tension and viscosity. The ultimate area covered by a given volume of oil will also depend on the surface roughness and the type and amount of vegetation and/or snow cover in the spill area. Researchers examining the potential oil-holding capabilities of ice and snow have estimated that between 1 and 6 million barrels of oil could be restricted to less than one square mile (*Oil in the Arctic,* Hoult, 1974, and *Fast-Ice Thickness and Snow Depth in Relation to Oil Entrapment Potential, Prudhoe Bay, Alaska,* Barnes et al., 1979). A volume on the order of 1 million barrels/mile, or about 1,600 barrels/acre, corresponds to an average oil thickness of approximately 2½ inches. If the ground or ice surface is very rough with heavy accumulations of snow, the average oil depth could easily approach 10 inches with a fourfold increase in the above oil-holding capacities. The temperature of even such large volumes would rapidly approach the ambient air temperature, and the oil would remain immobilized throughout the winter.

The potential oil-holding capacities described above are presented graphically in Figure 1-9 along with other conditions including spills under ice, over ice (or frozen ground), and on water. Any spill observer should be familiar with this figure to assess color-thickness relationships appropriately and to make responsible estimates of the volume of oil spilled.

The following paragraphs summarize experiments conducted by MacKay et al. (1974) on the relationship between snow and oil.

Their observations suggest that in a spill of constant temperature oil on snow, the penetration will tend to take the form of complete filling of the voids until there is a decrease in the hydraulic head. If the head drops, then gravitational flow of oil assisted by capillary forces will occur, draining the saturated region with only partial saturation of the voids in the newly contaminated snow. Oil viscosity is likely to be the most critical variable. Ultimately, the amount of oil remaining as a coating on the drained snow crystals will depend on the nature of the snow, but it appears that it may amount up to about 20% of the void volume. Depending on the oil temperature and snow temperature, the oil-water mixture may freeze, blocking further penetration.

It is likely that oil spills taking place on snow will not flow as great a distance as those occurring on land. This is due primarily to the sorbent qualities of the snow and the effects of lower temperatures on oil viscosity.

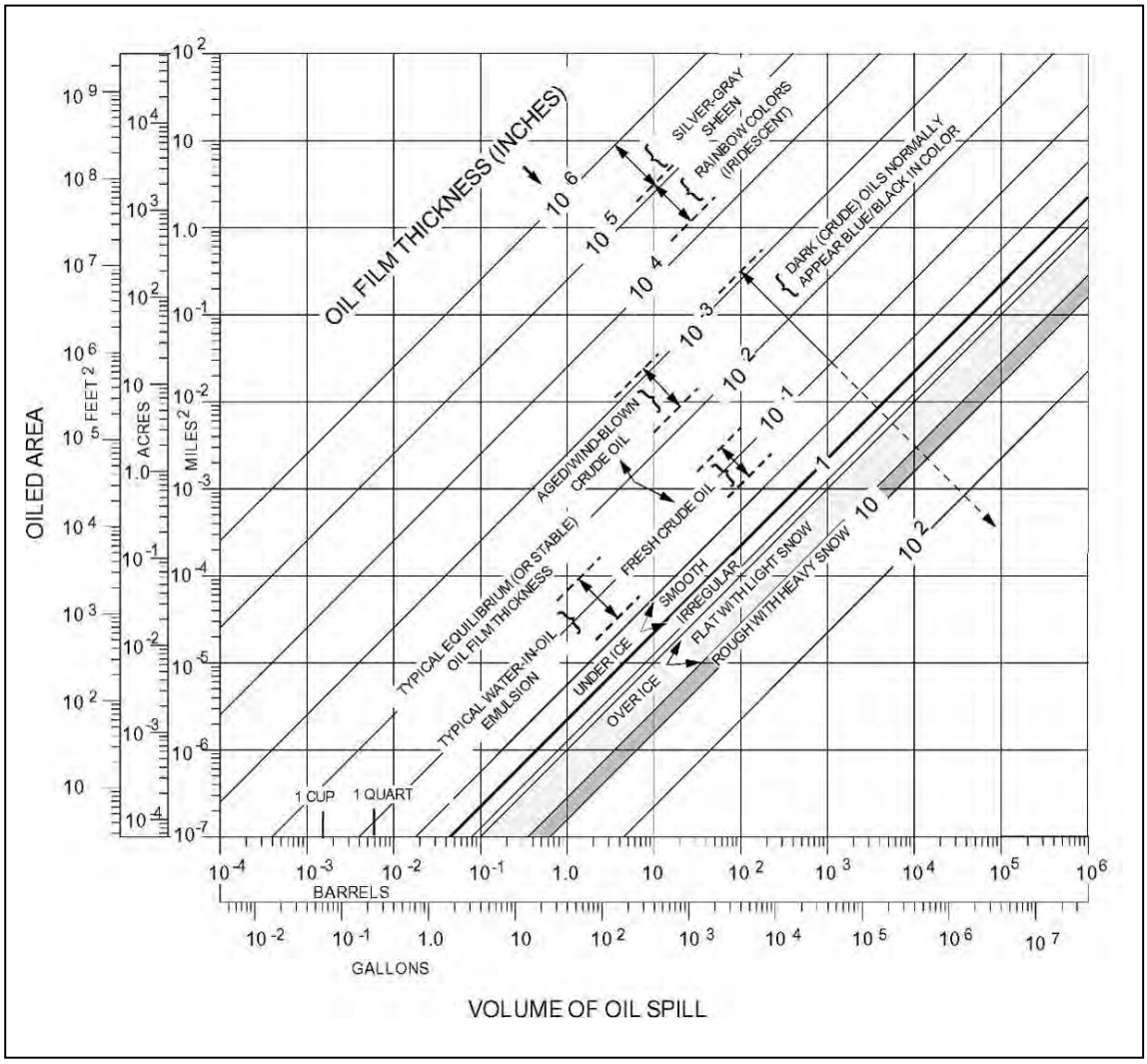


FIGURE 1-9 OILED AREA VERSUS SPILL VOLUME AND THICKNESS (ARCTIC/SUBARCTIC CONDITIONS)

1.6.3.4 Oil Under Ice Behavior and Tracking

The Department of the Environment, Canada (1982) conducted a study of the behavior of oil under floating ice. The following paragraphs summarize the study results.

Keevil and Ramseier conducted two studies: one laboratory study and a study of actual accidental spills. The laboratory experiments were designed to simulate a hot spill under floating ice. The hot crude oil separated into small particles (0.1 to 2.0 cm diameter) which rose to the ice-water interface. Under planar ice, the oil particles spread concentrically at a rate of about 1.0 cm/sec. On still water, the particles coalesced and formed an oil lens about 1.0 cm thick, which became trapped in concavities in the ice along the ice-water interface. When the ice was allowed to grow, the oil became trapped between the existing ice and the newly formed layers of ice. This phenomenon did not alter the growth rate of new ice.

In comparing the data gained from their laboratory study with that obtained from actual accidental spills, Keevil and Ramseier found essentially the same processes taking place. Crude oil from actual accidental spills formed small globules that tended to spread concentrically. Pour point is important for predicting the initial behavior of oil spilled under ice as oils with higher pour points will solidify and cease to spread. Oil from a sunken tanker floated to the surface in a discrete rope-like formation. In many spills, oil does not have the opportunity to spread under the ice.

Figure 1-9 can help in estimating the volume of a spill over a solid surface where the area of the spill can be observed and estimated. For a spill under ice when the approximate volume of oil is known, use the figure to estimate the potential area of oiled ice. Oil reaching the under-surface of solid ice will be contained by the roughness of the under-ice surface as oil accumulates in subsurface depressions. With time, the oil may move to and collect in cracks or other openings in the ice. The oil will then become immobilized as new ice grows around and beneath it. Before the oil becomes entrained in the overlying ice cover, currents approaching ½ knot would normally be required to remove any exposed oil and transport it from one subsurface depression to another.

When oil is spilled on top of ice, other factors should be considered in estimating spill volumes and planning appropriate countermeasures. For example, tests with various types of oil (Allen, 1979) have shown that even after 24 hours, fresh, undisturbed snow could hold between 20% and 40% oil (i.e., the percentage of oil present following meltdown of the oiled snow). It has been observed that Prudhoe Bay crude oil might initially constitute 60% to 70% of a saturated snow sample after the snow melts; however, within 24 hours, a melted sample of the oiled snow would likely contain about 40% oil and 60% water. Figure 1-10 illustrates such natural holding capacities for other oils as well. The actual natural holding capacities of any snow cover would depend on the type and amount of snow present. In any event, numerous experiences with oil and snow have revealed that the oiled snow can almost always be easily removed by hand or with earth-moving equipment.

Should oil be free to move over ice where cracks or other openings may provide access to the underside of the ice, caution must be used to limit the accumulation of oil in any opening. Crude oil with a specific gravity of about 0.86 to 0.88 would fill an opening in floating ice (specific gravity about 0.90 to 0.92) to a depth of approximately two-thirds the thickness of the ice. If the floating ice were free of snow cover, any additional oil flow would spread out over the surface of the ice, oil in this case would not fill the opening nor would it reach the underside of the ice. In reality, however, the ice would very likely have snow cover and/or surface roughness that would allow oil to accumulate over the opening. Should enough oil

accumulate to provide sufficient head of pressure to fill the opening, any additional oil would result in the flow of oil beneath the ice. Figure 1-11 shows how such an accumulation (called the critical pooling depth) could fill an opening in ice and what oil depths would be required for various thicknesses of ice.

Oil that spreads to beneath the ice will collect in under-ice pockets. Once in a pocket oil will tend to stay in place, since it takes a current of approximately 0.7 feet/second to push the oil out. Oil beneath the ice will be delineated by using a series of auger holes, drilled in a line from the source, to delineate the extent of the under-ice oil contamination, and then can be visually tracked.

1.6.3.5 On Water Tracking and Predictions

Oil spilled on a large inland body of fresh water will spread just as on salt water; but, since there is no tidal current, the wind will be the dominant force. Although the water flows toward the outlet of the lake, its rate of movement may be only a few feet per day. Since a 2-knot wind will move the slick at about 0.06 knot (0.10 ft/sec) or about 360 ft/hr, the wind will dominate slick movement except during periods of complete calm. For prediction, assume the slick will move in the general direction of the wind at about 3% of the wind speed. Oil entering rivers and streams will begin to spread, but the spreading motion will be rapidly overcome by the surface current of the stream or river. Thus, an elongated stream of oil is likely to form. Most streams along the pipeline route move quite rapidly, often at several knots, minimizing the effect of the wind on the stream surface. For prediction, assume that the oil will, in most cases, move at the stream or river velocity without wind effects. Response personnel should consider wind effects under low-current conditions.

The relationship among oil volume, area, and thickness is discussed in the following section as it relates to the spreading of oil on water.

The mathematical relationship among these parameters is provided below for various combinations of area and thickness units.

V (bbl) = (4.14 × 105) × A(mi2) × t(in.)

V (bbl) = 647 (acres) × t(in.)

V(bbl) = 1.48 × 10-2) × A(ft2) × t(in.) V(gal) = 42 × V(bbl)

where

V = Volume of oil spill

A = Area of oil slick or contaminated zone

E = Thickness of oil slick or contaminated zone (with snow, t = equivalent oil thickness)

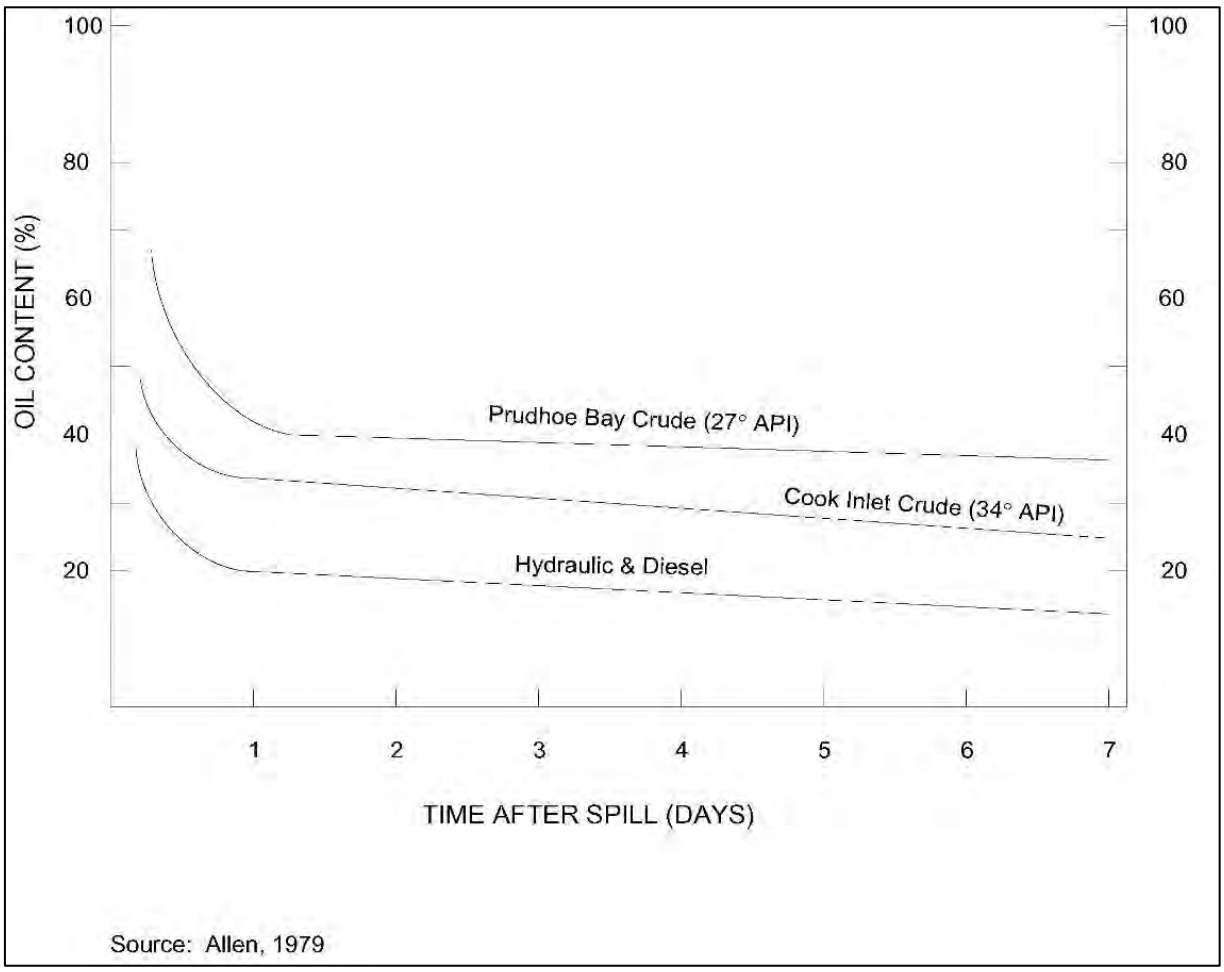


FIGURE 1-10 SNOW SORPTIVE CAPACITY

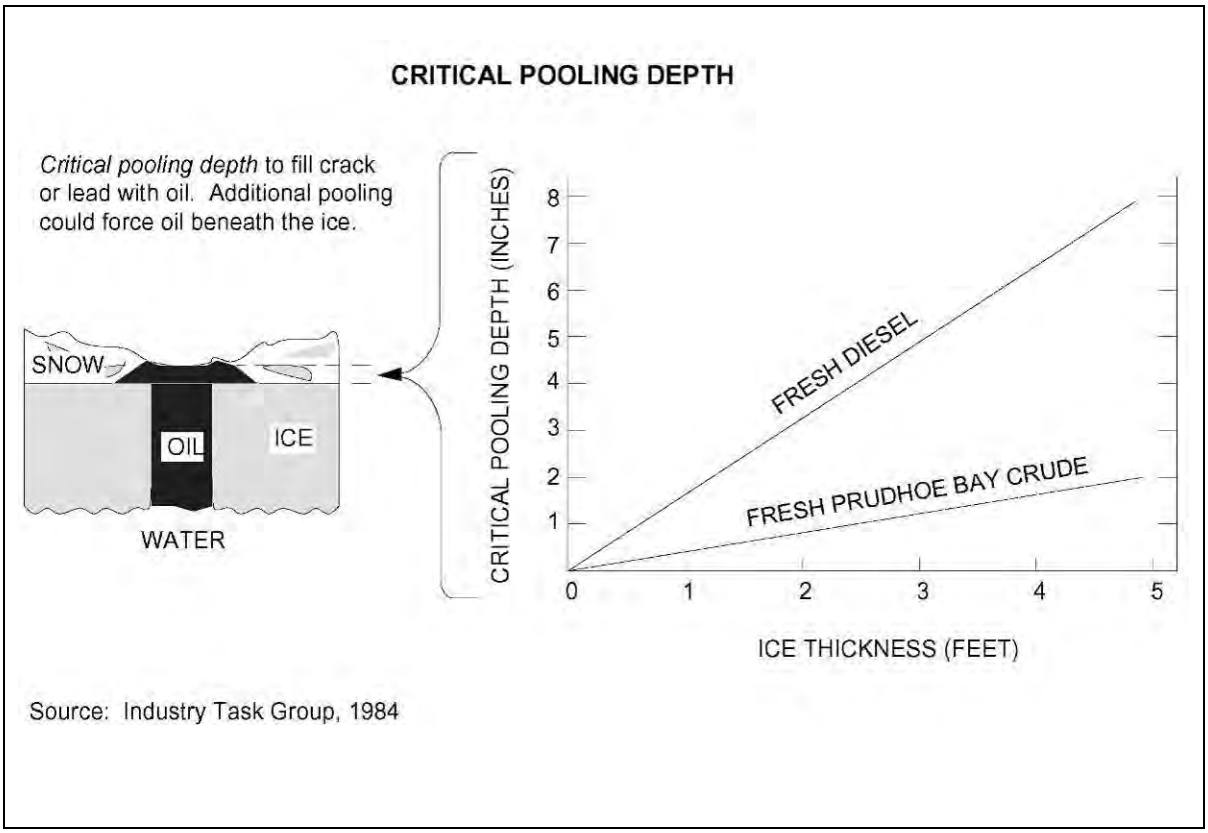


FIGURE 1-11 CRITICAL POOLING DEPTH

As film thicknesses approach the wavelength of light (on the order of 10^{-5} inch), the oil takes on the appearance of an iridescent or rainbow-colored film. This phenomenon is relatively independent of the type of oil spilled. Such films will frequently be surrounded by even thinner films (or silvery sheens) that may approach an average thickness on the order of a millionth of an inch. These rainbow-colored films and silvery sheens are extremely unstable and easily dispersed from the water surface with the lightest of wind, sea, or mechanical agitation. As shown in Figure 1-9, as little as a gallon of oil spread to a thin, though visible, film could cover many acres of water surface.

Volume 3, Tactics, provides detailed information and discharge data for selected rivers and streams located along the pipeline. It also presents data that can be used to predict oil movement for specific locations of potential spill sites.

1.6.3.6 Post-Spill Oil Behavior

The moving oil can adhere to surfaces of substances, permeate some materials, or stop at impermeable barriers or in depressions, forming pools. It can also enter the aquatic environment by surface or subsurface movement. Some of the lighter fractions of the oil will evaporate or dissolve rapidly; others are sensitive to sunlight and will oxidize to innocuous or inert compounds (photo-oxidation).

Eventually, oil spilled on land or water will be likely to disappear over a long period of time through the process of biodegradation. The bacteria that decompose oil are usually found in the soil, vegetation, or

stream/lake/ocean bottoms affected by the spills. The process is not fully understood, and could take considerable time without artificial acceleration.

Oil adherence can result in a partial or complete killing of surface vegetation, although it can act as a fertilizer for later re-vegetation. Penetration of the soil can affect hydraulic and chemical dynamics and increase microbial activity, often causing plant root death. If oil penetrates soil layers and enters the groundwater, aquifer contamination will result. Soil tends to retain some of the oil passing through and could prevent small spills from reaching groundwater levels. Once oil enters water, some fractions will dissolve in the water; the remainder may form oil-in-water or water-in-oil emulsions or adhere to sediment particles, making containment and cleanup actions difficult. Groundwater contamination can affect large areas and eventually could enter surface drainage systems.

Surface oil movement entering bodies of water would initially form a layer of varying thickness on the water surface; water velocity and wind/wave action would determine whether or not oil would form oil/water emulsions or adhere to sediment transported by a body of water. In either case, oil which is in contact with air will evaporate to some extent. Studies of oil-on-water spills show that the lighter fractions evaporate first (Kinney et al., *Kinetics of Dissipation and Biodegradation of Crude Oil in Alaska's Cook Inlet;* Smith and Macintyre, *Initial Aging of Fuel Oil Films of Sea Water,* 1971). Kinney et al. reported that a spill of Cook Inlet crude on water lost all C(12) and lower fractions within 8 hours. It is expected that the same trend of evaporation of lighter fractions would occur on land, but the evaporation rates are not likely to be the same. After initial evaporation, oil will tend to further degrade or weather, but it will leave residual or asphaltic compounds. These are frequently solid or highly viscous and may attain densities greater than that of ice or water. When this occurs, oil can become trapped between ice and water, or sink to the bottom of a water body.

During winter, oil spill movement would be slowed and/or stopped by surface irregularity in ice and absorption by snow. Low temperatures would retard flow. Oil exposed to wind would weather; that protected by snow cover or forming an oil/snow mulch would remain basically unchanged until thaw. With the arrival of thaw, oil would begin to disperse and behave as fresh and weathered oil.

1.6.3.7 Crude Oil and Suspended Solids Interaction in Silty Rivers

Beginning in 1997, a series of scientific investigations were conducted on the interaction of North Slope crude oil and silt in rivers crossed by the trans-Alaska pipeline. S.L. Ross Environmental Research of Ottawa, Ontario, Canada, conducted the studies in 1997, 1998, 1999, and 2000. Alaska Clean Seas commissioned the North Slope silty river study for the Colville, Kuparuk, and Sagavanirktok rivers. Alyeska Pipeline Service Company commissioned the pipeline corridor silty river study for the Yukon, Tanana, Delta, Tazlina, Klutina, Tsina, Tiekel, Copper, and Lowe rivers. Initial findings of the study determined that the silt loading (parts per million) was low for the North Slope rivers, Tiekel River, and Tsina River and did not have a material effect on oil spilled in these rivers. The remaining rivers have a seasonal silt loading sufficient to remove a significant portion of the surface slick.

The amounts of oil removed from the surface slick depends on the:

- Amount and rate of oil released in the river,
- Amount of solids in the river,
- Volume of water discharge rate, and
- Mixing energies available downstream of the release.

Mixing energies were approximated in the bench testing, because there are no reliable mixing models available for rivers. The mixing energy imparted by water turbulence and eddies is adequate to create a shearing action that will cause a surface slick to break up into small droplets, bind with silt particles, and be suspended in the water column. Depending on the droplet size and the density of the solid particles, and if enough particles adhere to an oil droplet, they may collectively cause the droplet to become neutrally or negatively buoyant. The aggregate particles would travel along the course of the river. Particles remaining in suspension would be widely dispersed downstream of the release point and would not resurface. Particles having negative buoyancy would be expected to widely disperse along the river bottom and inside eddies. The small size and distribution of these particles make them ideally available for biodegradation.

The range of oil-to-silt aggregation is expressed as grams of oil/(1) gram of solids. The seasonal range of aggregation for these rivers is shown in Table 1-13. An important factor affecting the potential for oil and silt interaction is the volume of water in the river. The discharge rate of the Tsina River is 1,930 cubic feet per second for summer compared to the Copper River summer discharge rate of 140,000 cfs.

TABLE 1-13 SEASONAL RANGE OF AGGREGATION

River	Aggregation Values
Yukon River	0.03 to 0.13 g oil to 1 g solids
Tanana River	0.001 to 0.07 g oil to 1 g solids
Tazlina River	0.01 to 0.45 g oil to 1 g solids
Klutina River	0.05 to 0.15 g oil to 1 g solids
Tonsina River	0.002 to 0.007 g oil to 1 g solids
Tsina River	0.01 to 0.24 g oil to 1 g solids
Tiekel River	negligible interaction
Copper River	0.04 to 0.19 g oil to 1 g solids
Lowe River	0.02 to 0.36 g oil to 1 g solids

The information resulting from these studies helps response personnel understand the interaction that will occur between the oil and silt particles. Absent the ability to do in-situ testing and verification of this information, Alyeska's strategy of containing and recovering spilled oil as close to the source as possible, and to pursuing spilled oil on the water surface as far downstream as possible, remains unchanged.

1.6.3.8 Surveillance by Air and Land

Aerial surveillance is one of the key tools used to track spill location and to plan the response. Alyeska will have the capability to supplement visual observations via the use of aerial infrared surveillance technology. Surveillance will be done primarily by helicopter but may also be done with fixed-wing aircraft. Communications between the surveillance aircraft, EOC, and ground crews is by VHF radio, usually on the Alyeska Radio-Telephone System (ARTS) or VHF marine frequencies. Communications between aircraft and response vehicles and vessels is by VHF radio.

It may also be possible to get updates on the location of oil that has gotten into river systems by contacting communities downstream of the discharge. Community contacts are provided in Alyeska's *Emergency Telephone Book.* (Refer to Volume 1, Section 1.2.2, "Emergency Contacts.")

1.6.4 Methods to Exclude Spill from Sensitive Areas

The purpose of this section is to describe the procedures and methods used to exclude oil from environmentally sensitive areas and areas of public concern. All of the important land, water, and biological resources along TAPS are potentially sensitive to spills and spill responses. These resources are identified and mapped in *EA-119, Environmental Atlas of the Trans Alaska Pipeline System,* a "Supplementary Information Document" (SID) to this plan. Because of the large number of potentially sensitive areas identified in *EA-119,* this section focuses on the protection of the most significant and immediately threatened areas, referred to as *priority environmental areas*.

EA-119 identifies several categories of important resources, including special areas (SA) that are designated in existing state and federal land use plans and related documents. The Bureau of Land Management (BLM) and the State of Alaska have defined all fish streams and peregrine falcon use areas along the pipeline system as zones of restricted activity (ZRA). Important wildlife use areas are identified in *EA-119,* including caribou and moose calving areas, caribou insect relief areas, wildlife concentration areas, Dall sheep lambing areas, wildlife migration areas, polar bear denning areas, waterfowl concentration areas, waterfowl nesting areas, and wildlife winter use concentration areas. *EA-119* identifies all known fish streams or waterbodies that are crossed by the pipeline, access roads, or spur dikes. Streams containing anadromous fish resources are also highlighted in *EA-119.* Because of seasonal differences in the sensitivity of each resource, *EA-119* provides sensitivity timelines for these resources.

Additional sensitive areas identified in *EA-119* include recreation areas, scenic resources, subsistence use areas, and cultural resource areas.

Information used to develop the list of priority environmental areas in this plan comes from the Alaska Unified Plan created by state and federal agencies responsible for oil spill preparedness and natural resource management. The Alaska Unified Plan contains specific contingency plans covering the North Slope Subarea, the Interior Subarea, and the Prince William Sound Subarea. These subarea plans, which cover the 800-mile pipeline corridor, contain information on sensitive areas that is intended to be used in planning for and during the initial phases of a spill to assist in ascertaining the location and presence of oil-spill-sensitive biological and cultural resources.

In the event of a spill, the Spill Response Incident Management Team will provide for consultation with state and federal agency experts in land and resource management in developing incident objectives and

prioritization of actions to protect environmentally sensitive areas throughout the response operation. Integration of agency personnel and resource protection information will be done by using a Unified Command approach at all levels of the Spill Response Incident Management Team.

The locations of priority environmental areas are identified in the following sections. Refer to *EA-119* for map locations and descriptions of other sensitive areas not identified here.

1.6.4.1 Locations of Priority Environmental Areas

Priority environmental areas are identified for each contingency area in the Containment Action tables in Volume 3. The discussion for each contingency area summarizes the order of priority, name of the area, and wildlife or resource potentially affected. These tables can be used in conjunction with the maps in *Volume 4, Map Atlas,* and *EA-119* to determine the location of priority environmental areas with respect to spill locations.

1.6.4.2 Priority Control Actions

Following the notification of a spill in a particular contingency area, actions to exclude oil from priority environmental areas will be initiated. Specific response actions are listed in tables in Volume 3 for each contingency area. These actions may be augmented or modified, depending on field conditions, to ensure worker safety and minimize environmental damage.

Some specific techniques for implementing the priority control actions are described in Volume 3, Section 4. In addition, Volume 1, Section 1.6.9, “Wildlife Response Plan” includes important information for protection of sensitive areas. Volume 1, Section 1.6.4, “Methods to Exclude Spill from Sensitive Areas,” contains specific procedures for protecting priority environmental areas.

1.6.4.3 Surface Sensitivities Related to Access

Access to containment sites and location of oil spills is via existing pipeline access facilities such as the haul road, pipeline workpad, access roads, and river training structures; or by state, federal, and private roadways. While these facilities will be used to their fullest potential, off-pad operations of varying degrees may be required. The impact of off-road operations can be limited by identifying and using old survey trails, fire breaks, seismic trails, and other potential access routes. Because these disturbed areas can be sensitive to both thermal and hydraulic erosion, care should be exercised when using these potential off-road access routes. In the event of an oil spill, rehabilitation may be required where it is necessary to gain off-road access to conduct containment and cleanup. When this occurs, *MR-48, Trans-Alaska Pipeline Maintenance and Repair Manual,* Section 23, should be adapted for use in selecting and implementing the proper combination of erosion control and restoration measures.

Because the consequences of off-road travel vary depending on vegetation, soil types, and physiography, damage caused by vehicle traffic must be considered in relation to the damage caused by the spill. In some instances, the hydraulic and thermal erosion and rehabilitation problems that can result from off-road travel may be more damaging and enduring than the environmental damage of the spill. The size, location, and probable environmental damage of the oil spill must be evaluated with regard to the consequences of containment, cleanup, and logistical support to determine the action to be taken. For example, if several thousand gallons of oil contaminate a habitat that is sensitive to surface disturbance during summer, more extensive and long-term damage might result from access and cleanup efforts than

from allowing the oil to degrade naturally. However, during winter with the surface frozen to a sufficient depth approximately 12 inches, very little surface disturbance could result, even from heavy tracked vehicles. This condition would allow cleanup efforts, even by tracked vehicles, to remove small volumes of oil without severe disturbance and possibly without any noticeable disturbance.

Because there may be occasions when more disturbance is caused by access and cleanup activities than by the oil spill itself, the following discussions will identify and explain the different sensitivities of habitats to surface disturbances and indicate how this information can be used to assist in decisions on access routes and cleanup operations.

1.6.4.4 Criteria for Determining Access

If an oil spill occurs, certain environmental sacrifices will have to be made to facilitate cleanup and recovery. Cutting and removing trees and heavy brush to provide access will not create undue disturbance if the surrounding vegetative mat is not disturbed. However, activities that create severe hydraulic and thermal erosion and rehabilitation problems should be avoided.

Seasonal Considerations

One of the primary considerations for determining an area's sensitivity to the problems discussed above is whether the surface is frozen or unfrozen at the time. Hence, identification and discussion of sensitivities will differentiate between winter and summer activity periods. Areas are considered sensitive to disturbance if organic layers, vegetative ground covers, and shrub layers are removed during trafficking to the extent that soil is exposed. Considerations of winter sensitivities apply to that period after the first 12 inches of the surface layer is frozen until the surface begins to thaw the following spring. Summer sensitivities apply to the remaining period, from the initiation of spring thaw to completion of fall freezeup through the first 12 inches of the subsurface.

Application of Guidelines to Access

The following guidelines have been developed to provide off-road access and to minimize surface disturbance. These guidelines are based on seasonal, physiographical, and biological considerations.

Summer Activity

During summer, access routes should not attempt to cross:

1. Wetland Areas (Black Spruce Bogs, Marshes, and Wet Tundra Communities)

   In these areas, even the most discriminate use of access vehicles might disturb the vegetative cover and expose areas of permafrost, ice lens, and ice-rich soil, leading to problems of thermal erosion and habitat degradation. Also, due to high moisture levels, these areas probably are impassable to most surface vehicles.

2. Slopes in Excess of 10%

   With discriminate operation, tracked vehicles can usually traverse slopes of 10% or less without tearing into the organic mat and vegetative cover. On slopes in excess of 10%, slipping of tracks

and ripping of the organic mat is more common. Therefore, these areas are considered susceptible to surface disturbance and to hydraulic erosion. Also, in many cases, they are impassable to all but tracked vehicles.

North-facing slopes commonly contain ice-rich soil or are underlain by permafrost, making them susceptible to thermal erosion problems as well. Disturbance of insulative vegetative and organic layers on slopes of all aspects can lead to severe hydraulic and thermal erosion problems which can be very difficult to control and correct.

3. Riparian Communities

   The upper soil horizons in these areas are usually composed of fine silts and clays which are highly susceptible to erosion. Disturbance can create severe problems of erosion, siltation, and revegetation. Gravel and sand areas may provide the most suitable access routes to cleanup areas. Where sufficient data allow, delineation of these zones will not include those areas that are composed of less sensitive gravels and sands, as these areas may, in fact, provide the most suitable access routes and containment and cleanup sites.

4. Alpine Tundra Communities

   Vegetative communities in the Alpine tundra grow slowly in response to short, cool growing seasons, and dry, shallow, nutrient-poor soil. Even light surface traffic can lead to vegetative disturbance and erosion, creating difficult revegetation problems due to climatic and biological limitations.

5. Small Fish-Bearing Water Bodies

   Specific Title 16 permits will be needed to cross these water bodies.

Winter Activity

During winter, the frozen state of surface and subsurface layers in most areas will allow access to containment sites, assuming that the vegetative layer is not removed or severely disturbed, and that incised stream banks are not cut. However, the following areas should not be traversed:

1. Slopes in Excess of 10%

   These areas probably will be impassable to all but tracked vehicles, even in winter. If attempts are made to traverse these areas by tracked vehicles, the vegetative cover probably will be severely disturbed. This will lead to the same erosion and subsequent control and revegetation problems discussed under summer activities.

2. Alpine Tundra Communities

   In winter, due to wind conditions, these areas frequently will have little snow cover and, due to low moisture levels, they will not have snow coverage to the extent that they are protected from tracked vehicle surface travel. Therefore, during winter, they are subject to the same sensitivities as summer.

Encroachment

Because of the scarcity of information on soil and permafrost adjacent to the pipeline, assessment of the extent of erodible soil, ice-rich soil or permafrost locations beyond the pipeline is not possible.

If encroachment of a surface-sensitive zone is required, protective measures will be taken so disturbance is minimized. Mitigating measures should include, at least, the following actions: only trees and shrubs that physically impede surface travel should be cut. Vehicles should drive over small trees and shrubs. Those that are moved should be cut and not pushed over so root masses and vegetative mats are not disturbed. When access routes follow drainages, a buffer zone of at least 100 feet should be established along the drainage. When access is required to cross drainages, incised banks must not be cut. Access should be via temporary fill ramps or large timbers.

1.6.5 Containment and Control Actions

Control actions are designed to halt the spread of oil, direct its movement, and minimize the area affected by the spill. Response strategies employing examples of tactics for oil containment can be found in the response scenarios in Volume 2.

To effectively execute control actions, it is crucial to provide preplanned containment and recovery instructions and alternatives available on which to base field decisions. The containment instructions found in Volume 3, Section 3, are advisory; they are not meant to limit the choice of action. Ultimately, the critical decision may be to prevent an oil spill from jeopardizing human safety, regardless of the environmental damage control actions could cause. Recovery of spilled oil may take place simultaneously with containment. Recovery procedures are discussed in Volume 3, Section 4.

The execution of control actions is contingent on variables such as equipment (for spill containment, spill recovery, transportation, and extended field action), environmental parameters, and communications.

Specific containment and control instructions for each segment of each contingency area along the pipeline are contained in Volume 3, Section 3.

In addition, Alyeska has designated over 220 areas along TAPS as containment sites. These sites are designed to facilitate the interception of oil in case of spills. Typically, these sites are located at streams or drainage structures or other natural access points to allow responders to contain and collect spilled oil as near to the source as possible. These site-specific response strategies are intended to mitigate oil damage to the environment through pre-identified locations, access routes, tactics, and resources. Volume 3, Section 5, contains detailed descriptions of containment site deployment tactics, criteria for site selection, and drawings and data sheets for all pre-identified containment sites.

1.6.5.1 Environmental Considerations

As a general rule, all efforts should be made to mitigate off-road use of heavy equipment during oil spill response operations in areas containing muskeg, wet tundra, and forested areas where the dominant tree species is black spruce (i.e., lowland spruce-hardwood forests, and north-facing slopes or poorly drained sites within upland spruce-hardwood forest). These three vegetation types are generally found on fine-textured soil that are poorly drained and underlain with permafrost. Such soils are highly susceptible to

erosion when the vegetative cover is removed or badly damaged. No off-road or off-ROW travel should be conducted without proper authorization.

Resource Damage Monitoring

In cooperation and coordination with state or federal agencies responsible for land management, the following methods for damage assessment monitoring are recommended.

Depending on the severity and location of a spill, the effects of oil contamination and cleanup operations on the biological communities, within the affected area, may be documented by sampling the affected areas as well as routine observations. A nearby undisturbed area should be used for comparison purposes.

Sampling and observations should be initiated as soon as practical after the spill, and be continued at intervals to document recovery of the biological community. The data obtained in the sampling program should be compiled and analyzed as deemed appropriate. The analysis will depend on the use for which the data is intended.

The sampling program should consist of a survey to determine the distribution and amount of oil in the area. A general count and/or percent of the organisms affected should be recorded and photographed. Each photograph should be properly identified with respect to location, date, photographer's name and witness, if present.

The following information shall be recorded as part of the sampling program:

- Date and time of sampling
- Location of sampling area
- Station or name of the sampling area
- Depth of oil penetration
- Name of person collecting sample

Other useful information could include:

- Type of substratum and/or profile, if necessary (i.e., sand, silt, gravel, peat, bedrock)
- Type of preservative used (i.e., alcohol, formalin, formaldehyde, etc.)
- Status of sample (i.e., sorted, collected but not analyzed yet, etc.)
- Name of person doing analysis
- Name of photographer and file information

1.6.5.2 Cleanup and Restoration

Spill cleanup and restoration refers to those actions that occur after the spill has been contained and the leak has been stopped. Cleanup activities required as an integral part of containment are discussed under the Contingency Area containment sections. Procedures for post-spill cleanup and restoration are presented in detail in Volume 3, Section 4.

Careless or uninformed actions taken during initial response may add to environmental damage and make subsequent rehabilitation difficult. For this reason, an Environmental Coordinator (EC) should be on hand during containment activities to help ensure that containment efforts do not cause unnecessary environmental damage.

The Operations Section Chief can, if necessary, request that additional persons with cleanup and restoration expertise be dispatched to the site. It should be emphasized that post-spill actions are not accompanied by the same urgency as control actions; therefore, time can be devoted to determining the best course of action. It may be desirable to obtain professional help from outside agencies or institutions.

The following cautions should be observed both during and after the initial response actions to minimize environmental damage and ease the job of restoration:

- Avoid disturbance to vegetated terrain except as definitely required for containment purposes. This applies to oil-soaked, as well as unaffected, terrain.
- Do not attempt to clean up oil until a plan of action has been determined by the Operations Section Chief in conjunction with the Incident Commander and the Restoration Supervisor.
- Utilize the environmental assessments provided for each segment.

Note: Handling of oil-affected wildlife, especially waterfowl, should be by trained personnel, or only as specifically directed by the Operations Section Chief, in conjunction with the Wildlife/Restoration Unit Leader.

1.6.5.3 Soil Erodibility and Sensitivity

Oil spill contingency planning for the trans-Alaska pipeline includes consideration of the soil along the ROW and those soils that may be contaminated by oil or affected by cleanup operations. A large oil spill would probably require the construction of several types of earth structures such as dikes, berms, and ditches. The type of earth structures that can be used depends partly on the soil available for construction material. The environmental damage and aesthetic disruption that may occur from the construction of oil containment structures will also depend on the in-place soil types.

The environmental damage resulting from an oil spill can be exacerbated by the improper construction and placement of earth structures and access trails. The location of a particular oil spill will usually dictate the general area where containment structures and access trails will be placed. However, the specific location should be selected to minimize environmental damage, a procedure accomplished by following these generalized guidelines:

1. *Minimize Clearing* - Most clearing of trees and brush would be in construction of access trails. The number of access trails to the site of an oil spill should be restricted.

2. *Existing Access Trails and Earth Structures* - Existing trails, roads, firebreaks, power line rights-of-way, and other access routes should be used whenever possible. Where possible, use existing structures, such as embankment roads, ditches, dams, and dikes for oil containment.

3. *Protect the Vegetation Cover* - The natural vegetation cover is usually erosion resistant and protects the underlying soil. Very little erosion will occur, if the cover is left intact. This is particularly true for frozen, ice-rich soil where the vegetation cover actually insulates the soil.

4. *Preserve the Natural Drainage* - The natural drainage pattern of any area has evolved over a long period of time and is usually sensitive to radical changes.

   Dams, ditches, dikes, and other drainage control structures should be sited and structured to complement the existing drainage pattern. Placing new access trails along the contours and constructing basins at the outfall of ditches are examples of ways to preserve existing drainages.

These guidelines for minimizing environmental damage should be followed whenever possible, particularly in summer when spill areas of the less viscous oil are more extensive and thaw is prevalent. However, areas of erosionally sensitive soil, such as ice-rich silts or clays, are much more likely to be damaged.

Soil along the pipeline alignment is generally protected by vegetation. If the vegetative cover is disturbed, thermal or hydraulic erosion may occur. The degree of erosion is, in part, determined by the soil type. The Soil Erosion Code (Figure 1-12) helps to determine the kind and extent of activities which a soil can support without erosion. If time permits, outside soil and biological experts should be consulted before initiating any action. The following paragraphs discuss thermal and hydraulic erosion and the Soil Erosion Code (SEC).

Soil Erosion Code Classification, Description, and Utilization

The SEC classification is a method of grouping soils encountered along the ROW in a manner that allows uniform design application of erosion control techniques. The classification is neither a strict textual nor generic classification, but rather a grouping of soils having similar erosion characteristics.

The SEC contains eight soil categories listed in Table 1-14 and two thermal states for each category. Analysis of soil borings, aerial photographs, and terrain unit maps identify soil categories and thermal states along the pipeline alignment and adjacent areas. Further analysis indicates seasonal variations (summer and winter) in trafficability and effects of surface disturbance. This information can help to determine the degree of erosion that activity on the soil may cause. Under some oil spill conditions, no action may be the preferred alternative.

Table 1-14 describes the erosion potential and recommended use of the soil groupings within each SEC classification. All SEC soils can be either permafrost (F) or thawed (T) except M soil which is always frozen (F)

Thermal Erosion

Degradation of permafrost can be introduced by man-made or natural disturbance to the insulating ground cover. This ground cover usually consists of humus, moss, or peat and living plants of the tundra or arctic forest. When the insulating layer is removed or disturbed, the summer thaw extends to a greater than normal depth. If the permafrost soils are ice-rich, those soils within the expected thaw depth will melt and the ground surface will settle. This phenomenon is termed thermal erosion. The resulting meltwater will mix with sediments forming a mud-like substance that is easily transported, even down gentle slopes,

by hydraulic action. This process will leave large gullies and pits that will increase in size during future summer thaw seasons.

Hydraulic Erosion

Surface hydraulic processes originate at drainage divides. Hydraulic erosion begins when water is unable to permeate the ground surfaces it travels over. The forces of cohesion, adhesion, and friction allow the water to pick up or drag particles and move them downslope. The process of hydraulic erosion is usually slow unless some alteration of the surface occurs. Surface water flow does not generally cause soil erosion where the soil layers are protected by vegetation. However, if the vegetative cover is disturbed and bare soil exposed, the potential for surface flow to cause extensive erosion is greatly enhanced, for both non-permafrost soil and permafrost soil not susceptible to appreciable thermal erosion. Exposure of fine-grained soil (silts and clays) is more critical than exposure of coarse-grained sands and gravels because the finer soils are more easily transported by water.

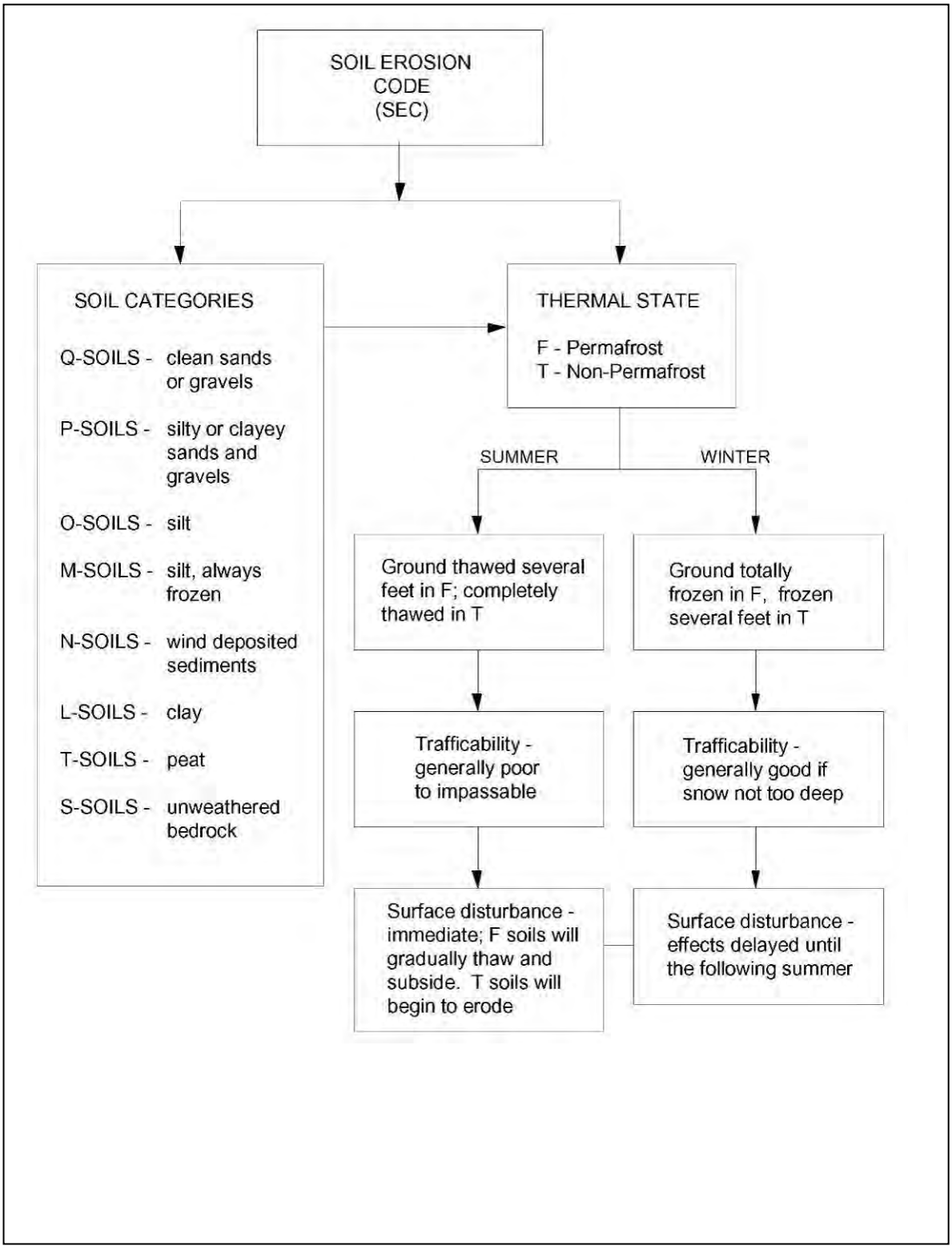


FIGURE 1-12 SOIL EROSION CODE

TABLE 1-14 TRAFFICABILITY OF SOIL EROSION CODE CATEGORIES

Soil Category	Description of Soils	Soil Erosion Code Category	Normally Trafficable During		If Traffic Permitted, Do Not Disturb Vegetative Cover
			Summer	Winter	
Q-SOILS	Soils consist of clean (low silt and clay content) sand or gravel or a mixture of the two. They tend to be erosion resistant. They can be traversed with both wheel and tracked equipment if thawed-ground vegetation is not too extensive. Disturbance of the vegetation will not cause extensive thermal or hydraulic erosion. This soil is highly permeable, so it may be contaminated to a considerable depth and will not store large volumes of oil for a significant length of time. They may be used to construct diversion barriers, but must be made impermeable for use as containment barriers.	FQ	Yes	Yes	Yes
		TQ	Yes	Yes	
P-SOILS	Soils consist of coarse-grained materials with up to one-half of their weights composed of silt and clay. Both FP and TP soil is susceptible to hydraulic erosion, whereas thermal erosion attacks only FP soil, particularly when they are primarily composed of silt and sand. Both soils are generally impermeable, but only TP soil should be used for containment barriers. FP soil should not be cleared or excavated. In summer, wheeled and tracked equipment can traverse the low-silt soil if vegetative cover does not restrict movement. Soil with higher silt content may only be passable with tracked vehicles. In winter, wheeled and tracked vehicles can travel across the terrain if the snow is cleared or packed. Care should be taken to avoid disturbing the vegetative cover above FP soil because thermal erosion may result.	FP	Yes	Yes	Yes
		TP	Yes	Yes	Yes
O-SOILS M-SOILS N-SOILS	Soils consist of fine-grained materials with silt composing more than one-half of their contents and are generally impermeable, but only TO and TN soil should be used as containment barriers. FO, FM, and FN soils should not be excavated, cleared, or traversed unless the potential thermal erosion problems are less damaging than leaving the spilled oil in place. These soils are highly susceptible to hydraulic and thermal erosion. In the summer, the FO, FM, and FN soils should not be traversed unless absolutely necessary because of the potential for vegetative surface disturbance resulting in thermal erosion. TO and TN soils usually require tracked vehicles because of their tendency to become extremely boggy when wet. Winter travel across all of these soils is possible, but extreme care should be taken to avoid disturbing the vegetative cover above FO, FM, and FN soils.	FO	No	Yes	Yes
		TO	Yes	Yes	
		FM	No	Yes	Yes
		FN	No	Yes	Yes
		TN	Yes	Yes	
L-SOILS		FL	Yes	Yes	Yes
		TL	Yes	Yes	
T-SOILS	Soils consist of organic materials: peat and humus. These soils generally occur in bogs and swamps. These soils are generally erosion resistant, but will easily depress, causing water to pond. They do not make adequate containment barriers. These soils are highly permeable and may be used as a sorbent. In winter, travel is possible, but care should be taken to avoid disturbing the vegetative cover over FT soil.	FT	Yes	Yes	Yes
		TT	No	Yes	
S-SOILS	Soils include unweathered parent material, solid rock such as granite or gneiss. These soils are not susceptible to hydraulic or thermal erosion. These soils cannot generally be excavated for oil spill containment.	FS	Yes	Yes	
		TS	Yes	Yes	

Note: *Dense vegetation may restrict travel on soil which would otherwise be trafficable. TO category soil is often extremely boggy in summer; travel may be difficult. Restoration of vegetative ground cover may be necessary for any disturbed soil.*

1.6.6 Recovery Strategies

Refer to Volume 3, Section 4.3 for tactics descriptions on Recovery Strategies, including:

4.3.1 Recovery - covers recovery of oil from water and land.

4.3.2 Response Equipment – describes response equipment available to control, contain, and recover spilled oil:

4.3.2.1 Skimmers

4.3.2.2 Weir Skimmers

4.3.2.3 Oleophilic Skimmers

4.3.2.4 Skimmers Selected for Alyeska Pipeline Service Company

4.3.3 Pumps – vacuum trucks or pumps (diaphragm and other types) are capable of pumping large volumes of oil and are essential in cleaning up a spill:

4.3.3.1 Diagphragm Pumps

4.3.3.2 Centrifugal Pumps

4.3.3.3 Screw Pumps

4.3.3.4 Vacuum Pumps/Systems

4.3.4 Sorbents – sorbents adsorb oil and/or oil adheres to the sorbent. This section discusses the use and limitations of each form of sorbent:

4.3.4.1 Squares and Strips (Pads)

4.3.4.2 Rolls

4.3.4.3 Sorbent Booms

4.3.4.4 Loose Materials

4.3.5 Accessibility – cleanup of spilled oil can be governed by weather conditions, accessibility, condition of oil, and other factors. This section discusses the different options for obtaining access to a site:

4.3.5.1 Road Access

4.3.5.2 River Access

4.3.5.3 All-Terrain Vehicle (ATV) Access

4.3.5.4 Remote Impact Areas Having No Access

4.3.6 Cleanup Techniques – covers five basic techniques that can be used singularly or in combination with each other to facilitate the removal of spilled oil.

4.3.6.1 Heavy Equipment

4.3.6.2 Pressurized Equipment

4.3.6.3 Manual Methods

4.3.6.4 Sorbents

4.3.6.5 Commercially Available Sorbents

4.3.6.6 Naturally Occurring Sorbents

4.3.6.7 Pumping and Flotation

1.6.7 Damaged Storage Tank Transfer Procedures

Refer to Volume 3, Section 4.4 for tactic descriptions on Damaged Storage Tank Transfer Procedures, including:

4.4.1 Crude Oil Relief Tank(s)

4.4.2 Turbine Fuel Tank(s)

4.4.3 Miscellaneous Gasoline and Fuel Tanks

4.4.4 Drag Reducing Agent (DRA) Tanks

1.6.8 Recovered Oil Transfer, Storage, and Disposal

Refer to Volume 3, Section 4.5 for tactic descriptions on Recovered Oil Transfer, Storage, and Disposal. This section provides the following:

4.5.1 Introduction

4.5.2 Incident-Specific Recovered Oil and Waste Management Plan

4.5.3 Recovered Oil and Waste Categories

4.5.4 Waste Identification and Characterization

4.5.4.1 Waste Characterization

4.5.5 Hazardous Waste Requirements Related to Spill Response

4.5.6 Recovered Oil and Waste Management

4.5.6.1 Recovered Oil

4.5.6.2 Oily Liquids

4.5.6.3 Oily Solids

4.5.6.4 Non-Oiled Solid Waste/Garbage

4.5.6.5 Domestic Wastewater

4.5.6.6 Other Wastewater

4.5.6.7 Animal Carcasses

4.5.6.8 Burn Residue Collection

4.5.7 Designated Waste Staging Area(s)

4.5.8 Estimating Amount of Recovered Oil

4.5.8.1 Tanker Strapping Charts

4.5.8.2 Sump Injection

4.5.8.3 Oil Metering Skid

4.5.9 Air Monitoring of In Situ Burn

1.6.9 Wildlife Response Plan

Wildlife

All wildlife protection will be conducted in accordance with the Alaska Regional Response Team (ARRT) *Wildlife Protection Guidelines for Alaska* and consistent with U.S. Fish and Wildlife Service (USFWS) publication "USFWS Best Practices for Migratory Bird Care During a Spill Response," the Alaska Department of Fish and Game (ADF&G), and any other trustee agencies.

Personnel should not chase or attempt to capture any wildlife that is oiled and/or appears in stress, unless the Wildlife Unit Leader has specifically initiated an approved recovery program and seeks assistance from field personnel.

1.6.9.1 Important Wildlife Along the Trans Alaska Pipeline System (TAPS)

The pipeline corridor supports a variety of wildlife species that are potentially sensitive to spills and spill responses. Important wildlife use areas are identified and mapped in *EA-119, Environmental Atlas of the Trans Alaska Pipeline System.* These include caribou and moose calving areas, polar bear denning areas, waterfowl concentration areas, waterfowl nesting areas, and wildlife winter use concentration

areas. Because of seasonal differences in the sensitivity of each resource, *EA-119* provides sensitivity timelines for these resources.

The animals of primary concern that might be affected by a spill or cleanup operations include:

- Moose
- Caribou
- Musk Ox
- Bison
- Dall Sheep
- Mountain Goat
- Black Bear
- Grizzly (Brown Bear)
- Polar Bear
- Furbearers including Fox, Mink, Beaver, Otter, Muskrats, etc.
- Raptors (birds of prey) such as Bald Eagle and Peregrine Falcon
- Wide variety of waterfowl, shorebirds, and other ground-nesting birds

The general distributions and characteristics of important wildlife that occur along TAPS are discussed in the following paragraphs. Refer to *EA-119* and the containment actions tables in Section 3 of Volume 3 for site-specific information on the distribution and seasonal sensitivities of these species.

Moose

Except at high elevations in the Brooks and Alaska Ranges, moose are found along the pipeline corridor from Happy Valley to the Lowe River Valley, and generally most abundant between PS07 and PS12. Moose are not abundant south of the Chugach Mountains because of the heavy snowfalls that are common to the area. Moose may be aggressive toward people and equipment; this is particularly true of bulls during the rutting season (late August through October) and cows with calves (late May to August). Personnel should be aware of their presence and approach them with caution.

At the end of a severe winter, many moose are close to starvation. When in this weakened condition, they may die if forced to move a great deal. Personnel should take care not to disturb known concentrations of moose, particularly during winter operations.

Caribou

There are two caribou herds seasonally observed in the vicinity of the pipeline; one in the Nelchina Basin from Summit Lake south to Glennallen during spring and fall migrations and the other on the North Slope from Atigun Pass north to PS01. During caribou migratory periods, portions of both herds have been observed moving on or across the pipeline ROW and under the elevated pipeline.

Caribou are mobile rather than sedentary or territorial; therefore to date, caribou have not encountered or been directly involved in any pipeline oil spills.

There are potential caribou calving areas adjacent to the first 12 miles of the pipeline corridor.

Musk Ox

Musk ox sightings are relatively common from the Sagavanirktok River floodplain to PS04. Small groups have been noted in the river floodplain adjacent to PS02. Single animals, believed to be mature bulls,

have been observed at various floodplain locations from Franklin Bluffs south to the vicinity of PS04. Four to five other herds numbering from 4 to 10 have also been seen in the area from time to time.

Due to their small numbers and wide distribution within the Sagavanirktok River floodplain, it is not likely that musk ox would be affected by a pipeline oil spill.

Bison

There are two bison herds in the vicinity of the pipeline: one on the Delta River between Big Delta and PS10 and another smaller herd east of the Copper River. It is not likely that the Copper River herd could be affected by a pipeline spill.

Bison can be aggressive toward people and equipment, particularly during the breeding season (June through September). Personnel should be aware of their presence and approach them with caution.

Dall Sheep

Dall sheep are found along the pipeline above 2,500 feet in the Brooks Range, from PS04, south to approximately Cathedral Mountain, above 2,500 feet in the Alaska Range between Castner Glacier and Connelly, and above 3,000 feet in the Chugach Mountains from Pippin Lake to the Tsina River. In the Brooks Range, Dall sheep are known to move across the pipeline corridor in the Dietrich River Valley near Wiehl Mountain. There are sheep salt licks near the pipeline at Table Mountain, Snowden Mountain, and Snowden Creek. Sheep also move across the Atigun Valley, and a lick appears to be present at Slope Mountain.

Dall sheep lamb in early May through mid-June at elevations above 2,500 feet in the Brooks and Alaska Ranges and above 3,000 feet in the Chugach Mountains. Lambs are vulnerable to injury when sheep are panicked in rough terrain by low-flying aircraft. Low-flying aircraft used in reconnaissance and cleanup operations should be kept away from mountainous areas where Dall sheep reside from May through July.

Mountain Goat

Mountain goats are common inhabitants of the Chugach Mountains, south of Willow Lake.

Accidents, especially falls, are probably the greatest cause of natural mortality in mountain goats. Kids are particularly vulnerable to injury when goats are panicked in rough terrain by low-flying aircraft. Low-flying aircraft used in reconnaissance or cleanup operations should limit their travel to the pipeline corridor south of Willow Lake from May to late July.

Black Bear

Black bears are found along the pipeline from approximately Wiehl Mountain on the south slope of the Brooks Range to Port Valdez. They most often inhabit relatively open forests that contain a large amount of fruit-bearing shrubs and herbs, grasses, and forbs. These animals generally avoid extensive open areas; therefore, they are not expected to be seen in areas covered primarily with tundra or muskeg.

Black bears adapt quite readily to human activities; however, they have been known to attack humans with no apparent provocation. They will vigorously defend their cubs and food supplies. Consider black

bears extremely unpredictable and dangerous and avoid them whenever possible. No one should attempt to feed these bears no matter how tame they may seem.

Black bears will feed on garbage and can be expected to congregate in areas where garbage is not properly handled. Return all field-generated garbage to pump stations or maintenance centers for proper disposal.

Grizzly (Brown Bear)

Grizzly or brown bears are found along the pipeline route from Prudhoe Bay to Valdez. They are adaptable to all types of vegetative communities from the Sitka spruce dominated coastal region through the buck aspen of interior Alaska to the tundra of the North Slope.

Grizzly bears are extremely unpredictable and dangerous. Personnel should be aware of their presence and avoid them. Do not attempt to feed these bears even if they appear tame; they are wild animals.

Like the black bear, grizzly bears are attracted to garbage. Return all field-generated garbage to pump stations, response bases, or staging areas for proper disposal.

Raptors

Except for several species of owls, the gyrfalcon, goshawks, golden eagles, bald eagles, red-tailed hawks, and sharp-shinned hawks of southeastern Alaska, most raptors are summer residents of Alaska. Areas along the pipeline that are recognized as potentially important raptor habitat are given below:

- Roughlegged hawks, gyrfalcons, golden eagles, and peregrine falcons nest in cliffs and bluffs along the Sagavanirktok River between PS01 and PS04.
- Raptors inhabit the mountains adjacent to the pipeline in the Brooks Range between PS04 and about Snowden Mountain.
- Raptors nest in the vicinity of Globe Creek and the Tatalina River.
- Raptors nest near the confluence of the Tanana and Delta Rivers. Most nests are found in the bluffs along the north bank of the Tanana River.
- Golden eagles and possibly peregrine falcons, as well as other raptors, are found along the pipeline between Squirrel Creek and the Little Tonsina River.
- Thirteen raptor species inhabit the Lowe River Valley, including the peregrine falcon and bald eagle. Known bald eagle nesting sites occur near Material Site 1-2, Salmon Slough, Eight Mile Slough, the Lowe River near Hendo Gorge and Seventeen Mile Creek.

Personnel should avoid harassing individual raptors and their nests.

Waterfowl

Except at high elevations in the Brooks Range, Alaska Range, and Chugach Mountains, suitable waterfowl habitat is found along the entire length of the pipeline. Waterfowl species found along the pipeline are migratory and, except for a few species, spend the winter months south of Alaska. They return to the pipeline corridor in early May or June to nest and raise their young, migrating south again in

the fall. Many of the waterfowl species that nest in Alaska and winter on the Pacific Coast stop along the Alaska Coast during the fall and spring migration.

The heaviest concentration of waterfowl along the pipeline is on the North Slope between (b) (7)(F), [redacted] and in Port Valdez and Prince William Sound. Although more significant habitat in these two regions lies to the east and west of the corridor, the marshes, lakes, ponds, and streams in the vicinity of the pipeline support large numbers of waterfowl.

In the event that an oil spill reaches any water body, efforts should be made to keep waterfowl away from the oil until the oil is cleaned up. Volume 1, Section 1.6.9.4, “Procedures to Prevent Impacts to Wildlife,” gives further information on protection of waterfowl.

Concentrations of waterfowl and shorebirds are at a maximum between late spring (mid-April to late May) and early fall (early September to early November) because they congregate in flocks to travel to and from their nesting areas. Moderate concentrations of nesting birds occur throughout the summer in the interior and the North Slope regions, and a few species are present year-round. Raptors and small songbirds are abundant along most of the pipeline during the summer, and raptors may congregate in coastal regions during the winter.

When birds (especially waterfowl) become oiled, they lose buoyancy and natural insulation. They cannot fly, swim effectively, or keep warm. Birds try to remove the oil from their feathers by preening, which results in oil ingestion and possible poisoning. Oil ingestion can also block the bird's digestion mechanism of extracting fresh water from salt water, thus causing rapid dehydration. As a result of these factors, stress, shock, and exposure will kill oiled birds unless they are captured and properly rehabilitated.

Small Mammals

No attempt should be made to capture mammals. Risks of injury to workers and the potential of rabies in small mammals make it mandatory that experienced personnel from the U.S. Fish and Wildlife Service (USFWS) and Alaska Department of Fish and Game (ADF&G) direct any recovery attempts. These agencies should be notified and assisted if oiled small animals are found at the spill site.

Large Mammals

If injured or contaminated animals are found, the ADF&G should be notified and assistance requested.

Fish

Alaska has some of the most extensive fishery resources in North America. Lakes, streams, and rivers along the pipeline contain a wide variety of game and forage fish. The greatest threat of an oil spill to fish streams is during the ice-free season. However, during the winter months, some of these streams have open leads which may contain overwintering fish populations. Because response in broken ice is difficult, breakup and freezeup are also threatening periods. Care must be exercised to minimize disturbance to these systems.

1.6.9.2 Effects and Persistence of Discharge in Environmentally Sensitive Areas

The composition of crude oil and the chemical changes in composition due to weathering both affect the oil's toxicity to living organisms, including birds and mammals. The chemical compounds in petroleum vary in their toxicity to wildlife.

The toxicity of alkanes above C10 to wildlife is very low due to their low solubilities. Mixtures of high-molecular-weight alkanes, such as paraffin oils, are considered inert and sometimes are used as laxatives. Low-molecular-weight alkanes (methane through octane) have mild anesthetic properties and, because of their volatility, occur primarily in a form that could be inhaled by humans and other air-breathing animals. Low-molecular-weight cyclic alkanes (cyclohexane and several methyl cyclohexanes) are moderately toxic to aquatic organisms and could contribute to the toxicity of oils that contain high concentrations of these compounds.

Aromatic hydrocarbons are the most toxic of the major classes of compounds in petroleum. In fact, the acute toxicity of crude oil to aquatic organisms and mammals is directly correlated to the concentration in the petroleum of light aromatic hydrocarbons (benzene through phenanthrene). Some higher molecular weight four and five-ring PAH could contribute to long-term effects in sediment dwelling organisms. However, their concentrations in crude oil are usually quite low.

The toxicity of aromatic hydrocarbons to aquatic plants and animals is inversely correlated to molecular weight. However, because of the inverse relationship between aromatic hydrocarbons' molecular weight and aqueous solubility, acutely toxic concentrations of aromatic hydrocarbons with four or more rings or extensive alkyl substitution are higher than their solubilities. At the other extreme, the monocyclic aromatic hydrocarbons, benzene, toluene, and xylenes, are so volatile that they are lost very rapidly from water and, therefore, contribute little to the acute toxicity of petroleum to living organisms. Thus, the naphthalene and phenanthrene, which are slightly soluble and relatively persistent in water, contribute most to the toxicity of crude oil to marine organisms. The nitrogen-and-oxygen-containing heterocyclics (e.g., dibenzothiophenes and dibenzofurans) have a toxicity similar to that of aromatic hydrocarbons of similar molecular weight. Thus dibenzothiophene, which is abundant in North Slope crude oil, also may contribute significantly to its toxicity.

Petroleum hydrocarbons in particulate form (e.g., dispersed oil droplets, mousse, and tar balls) or absorbed to sediments, are much less bioavailable and, therefore, less toxic than hydrocarbons in solution. For example, concentrations of 1 ppm of total petroleum hydrocarbons from crude oil in solution can cause adverse effects in sensitive water column organisms, whereas sediments containing as much as 1,000 ppm crude oil may not be toxic to the biota residing in the sediments. Thus, in predicting the potential impacts of spilled oil, it is essential to know the physical form of the spilled petroleum hydrocarbons.

The North Slope producers inject an annual daily average of 60,000 barrels per day of natural gas liquids (NGLs) into the crude oil delivered to PS01. Natural gas liquids are a combination of gases identified as butane (C-4), pentane (C-5), hexane (C-6), heptane (C-7), octane (C-8), and nonane (C-9). These gases are characterized as high vapor pressure and, at atmospheric pressure, vaporize quickly. These gases are also low molecular weight hydrocarbons and have low solubilities in water in the range of 1 part per million or less. Natural gas liquids contained in the crude oil stream are not predicted to contribute to an increased toxicity of North Slope crude oil and will generally dissipate to atmosphere within a short period of time.

1.6.9.3 Procedures to Exclude Oil from Sensitive Areas

Volume 3 describes mapped projections of discharge movement and probable points of contact. For each probable point of contact, Volume 3 also describes associated environmentally sensitive areas and areas of public concern. It also provides contingency area discussions with topographic maps marked with resource icons, tables, and maps of priority environmental areas. In addition, aerial photographs show predicted discharge movement and points of contact. Descriptions include the effect of seasonal conditions on the sensitivity of each area and the identification of which areas would be given priority attention. Many priority environmental areas are surface waters. These are listed in the hydrology tables located in Volume 3, Section 6. Protective measures specific to each season for each water body in the table are described.

The effect of seasonal conditions on environmentally sensitive areas is discussed in Volume 1, Section 1.6.9, “Wildlife Response Plan” and Volume 1, Section 1.6.3, “Real-Time Surveillance and Tracking of Spill on Land and Water.” Snow and ice, for example, often protect vegetation and water from oil spills. Seasonal effects on the sensitivity of soils to erosion from response activities are discussed in Volume 1, Section 1.6.4, “Methods to Exclude Spill from Sensitive Areas.”

In Volume 3, the environmental column of the Initial Response Action tables provides a discussion of seasonal variation in susceptibility of wildlife populations to spilled oil. Similarly the Containment column addresses season-specific control actions.

1.6.9.4 Procedures to Prevent Impacts to Wildlife

In addition to the wildlife care and rehabilitation procedures described here, the Alaska Regional Response Team’s *Wildlife Protection Guidelines for Alaska* are to be followed in conjunction with approval from the U.S. Fish and Wildlife Service (USFWS) and the Alaska Department of Fish and Game (ADF&G).

Response Actions

In the event of a major oil spill along TAPS, birds and some mammals may come into contact with oil on the water surface along rivers, streams, lakes, or in depressions on land where oil has collected. The number of individuals and the species affected will depend upon several variables, including the size and location of the spill, wind and water currents, and the time of year the spill occurs. In the following sections, strategy and response actions for preventing contamination and for the capture and rehabilitation of oiled wildlife are discussed. Specific detailed procedures for hazing, transportation, and care have not been delineated here. Such treatment requires expert handling. The Wildlife Unit Leader will coordinate any wildlife capture and rehabilitation program conducted by wildlife treatment contractors.

Following a spill, the Wildlife Unit Leader or designees and/or the Surveillance Supervisors will determine areas that may become contaminated with oil and take prompt actions to minimize contact between animals and oil. Detailed and specific procedures for preventing contamination of animals through hazing cannot be formulated in advance. The Wildlife Unit Leader will also determine the spill’s potential impact on mammals and birds and will develop and organize appropriate preparedness for capturing, transporting, stabilizing, and rehabilitating oiled wildlife.

Alyeska's basic strategy for wildlife care and rehabilitation will be as follows:

1. When small numbers of wildlife are affected, steps will be initiated to prevent any additional oiling of wildlife.

2. When large numbers of wildlife or any number of a particular species of special concern (as designated by appropriate wildlife agencies) are affected, assistance from a private consulting and services group will be requested.

To significantly enhance survival of wildlife, the capture, transportation, stabilization, and rehabilitation of oiled wildlife requires specific and specialized equipment, expertise, and materials. Alyeska has contracted with the International Bird Rescue Research Center (IBRRC) at Berkeley, California, to provide its services for use during major oil spills that involve large numbers of wildlife. Table 1-15 lists individuals and organizations to notify in order to summon resources. IBRRC provides technically trained personnel, including veterinarians, and training of field personnel to qualify them for capture and transportation of wildlife. If raptors have been oiled at the spill site, IBRRC will coordinate with the Bird Treatment and Learning Center (Bird TLC) in Anchorage for the capture and treatment of raptors (see Table 1-15). At any time, persons with expertise may be flown in with specialized equipment and commodities to assist in recovery operations.

Permits are required for most wildlife response work. Under the Migratory Bird Treaty of 1918, it is illegal to capture and hold species of migratory birds without a permit from the U.S. Fish and Wildlife Service (USFWS). The IBRRC has been issued such a permit for Alaska. In the event of any spill with the potential for impacting wildlife, the appropriate state and federal agencies would be contacted and requested to issue permits for capture and treatment of birds if the IBRRC is not on site (see Table 1-15). IBRRC would not be conducting hazing. Hazing would be conducted by trained TAPS personnel (Security, Environment) or ACS personnel.

As soon as any oil spill with the potential of impacting wildlife is reported, the Wildlife Unit Leader will make a complete reconnaissance of the spill area to determine types and numbers of animals affected or potentially affected. If animals are being affected or if a potential exists, the Wildlife Unit Leader will initiate measures to prevent further animal oiling and, depending on the potential effects, notify the IBRRC. Advice and assistance may be requested from federal and state fish and wildlife agencies by the Wildlife Unit Leader as he/she deems necessary.

If necessary Alyeska and its contractor, the IBRRC, will carry out a wildlife program involving the capture of oiled birds in the spill area, transportation of oiled birds to TAPS stabilization facilities, stabilization, transportation of oiled birds to rehabilitation facilities in Anchorage, rehabilitation, and eventual release. Alyeska Environmental Coordinators (EC) (see Table 1-15) and trained Alyeska personnel, under the guidance and assistance of state and federal agencies, will conduct wildlife hazing in oiled areas.

TABLE 1-15 PRIMARY ROUTES OF NOTIFICATION

Notified Position	Name of Recipient	Phone Number [1]
Wildlife Unit Leader	Ken Wilson David Schmidt / Jim Lawlor Jim Lawlor	(907) 450-5732 (907) 787-7682 (b) (6) (cell)
Environmental Coordinators	Cathy Girard Kate Montgomery	(907) 787-4185
	Jim Lawlor	(907) 787-7682
Alaska Clean Seas, Deadhorse	Person on shift	(907) 659-2405
Alaska Wildlife Response Center (IBRRC - Alaska) Director of Response Services	Barbara Callahan	(907) 562-1326 (707) 207-0380 24 hours
International Bird Rescue Research Center, Berkeley (IBRRC)	Barbara Callahan	(907) 562-1326 work (b) (6) cell cell (907) 277-4956 fax
	Jay Holcomb	(707) 207-0380 work (b) (6) home cell (707) 207-0395 fax
	Curt Clumper	(206) 527-0376 work (206) 527-0376 fax
Bird Treatment and Learning Center	Main Office	(907) 562-4852
Oasis	Dave Trudgen	(907) 258-4880 work (b) (6) home cell
U.S. Dept. of Interior		(907) 271-5011
U.S. Fish and Wildlife Service	Catherine Berg, primary	(907) 271-1630 work (b) (6) home cell (907) 271-2786 fax catherine_berg@fws.gov
Alaska Department of Fish and Game		(907) 267-2338 work (907) 267-2464 fax (907) 459-7363 work (907) 456-2259 fax
JPO DNR Habitat	Lee McKinley	(907) 257-1307

[1] All phone numbers are for Anchorage unless otherwise noted. Note that updates to the position titles and telephone numbers may be found in Alyeska's Emergency Telephone List, distributed quarterly.

Hazing

Alyeska trained personnel (including trained contractor personnel) conduct hazing at the spill site under the guidance and assistance of state and federal wildlife agencies (ADF&G, USFWS).

Wildlife Response Training is provided for field personnel as a two-day training event that includes Rossi (USDA) Wildlife Deterrent training (hazing) and IBRRC or Alyeska training on wildlife capture and stabilization. ACS personnel used in wildlife response are trained by the USDA and IBRRC. ACS maintains training records for Alyeska contractor personnel that may be used in the event of a spill. Additional Alyeska or contractor personnel needed to staff a wildlife hazing activity would receive an on-site task briefing from the Hazing Team Leader(s). Permit requests for hazing are generated by the ICS Environmental Unit. These permit requests are then submitted to the Federal On-Scene Coordinator and State On-Scene Coordinator (FOSC and SOSC) for processing by state and federal wildlife agencies. The permit request for hazing will identify the species to be hazed, the objective of the hazing, procedures, equipment, number of people involved, and the location(s) of the hazing.

A number of deterrent devices are included in Alyeska's oil spill contingency supplies. Methods that have been used to repel birds include automatic exploders, sound devices, flashing lights, and balloons. Propane cannons, helium balloons, and Mylar tape are included in the bird cleaning supplies located at Prudhoe Response Base, Fairbanks Response Base, and the SERVS Warehouse. 15mm launching pistols and pyrotechnic supplies are held by Security at SERVS. 12-gauge cracker shells and shotguns are available at the guard station of each response base and VMT.

The habits and characteristics of the birds located in the spill area should be captured to determine the optimum locations for the bird-repelling devices. During most of the summer, wetland areas and lake shores are important sites because potentially affected bird populations consist primarily of shorebirds and nesting or fledgling waterfowl. In addition, migratory waterfowl and shorebird staging areas are important deterrent sites during spring and fall. In upland areas of the pipeline corridor, hazing may be directed at ground-nesting birds and avian scavengers. These include several shorebird species in dry tundra habitat, as well as ravens, magpies, and eagles.

Capture, Transportation, and Treatment

Techniques have been developed that are relatively successful for cleaning and rehabilitating oiled wild birds. A combination of better cleaning procedures and handling care, with use of medications to reduce stress, has resulted in increased survival rates. The Wildlife Unit Leader will maintain reports that best describe the most acceptable techniques. Qualified, trained personnel will collect, care, and treat birds or any wildlife.

In the event of oiling of birds or other wildlife, Alyeska has contracted with the IBRRC to provide services and training on the capture, transportation, stabilization, and rehabilitation of animals during major oil spills that involve large numbers of wildlife. All wildlife protection will be conducted in accordance with the Alaska Regional Response Team *Wildlife Protection Guidelines for Alaska*. Stabilization units are prestaged on the North Slope, Fairbanks area, and in Valdez. ACS maintains the unit on the North Slope, currently wired and plumbed for use at its current location in Prudhoe Bay. The Fairbanks and Valdez units are maintained by Alyeska, and are mobile units that may be mobilized to a spill site as needed.

When oiled wildlife has been captured and stabilized, it may be transported to the central rehabilitation facility, IBRRC's Alaska Wildlife Response Center, located in Anchorage. At this facility, the wildlife will be given long-term care until they can be released.

General Guidelines

The Wildlife Unit Leader will define procedures for bird care based on his/her knowledge of the location of the spill, the bird population at the time, climatic conditions, and the availability of additional labor force. The Wildlife Unit Leader would base decisions on the steps outlined in the Wildlife Unit Leader's Checklist (Figure 1-13). In the event that any birds are oiled or have the potential of being oiled, these general guidelines will be followed:

1. Alert the IBRRC.

2. Deploy bird repelling devices to sites where birds might become oiled.

3. Take further steps to prevent other animals from contacting oil.

4. Caution workers in the spill area not to chase or capture oiled birds or other animals unless instructed by the Wildlife Unit Leader.

5. Start up the wildlife capture and treatment program.

1.6.9.5 Recovery and Disposal of Dead Wildlife

Euthanasia may be appropriate for some distressed, oiled animals under certain circumstances. In a wildlife response, however, euthanasia would be conducted only under the guidance of federal and state wildlife agencies and IBRRC's designated veterinarians. Furthermore, the veterinarians' euthanasia criteria would receive the concurrence of the agencies before that component of the wildlife response program were put into effect. That is, the decision and the performance of euthanasia would be limited to veterinarians, but based on predesignated guidelines established by the wildlife agencies. The status of the species as threatened or endangered would have a bearing on euthanasia decisions and the agencies' guidelines.

WILDLIFE UNIT LEADER'S CHECKLIST FOR EARLY ACTIONS

____ Receive notification from Plans Section Chief.

____ Assess the potential and actual impact on sensitive areas and on wildlife in coordination with federal and state wildlife agencies.

____ Evaluate the need for hazing unoiled wildlife and capturing oiled wildlife.

____ Notify IBRRC to standby or mobilize, as needed.

____ Assemble information from Operations Section and Situations Unit.

____ Survey the Priority Sensitive Areas.

____ Assist trained personnel to mobilize hazing teams or to standby.

____ Notify the wildlife trustee agencies of intent to conduct wildlife response (see Table 1-51 on page 1-248).

____ Plan the hazing, capture, transportation, stabilization, and rehabilitation with with federal and state wildlife agencies.

____ Obtain permits and authorizations from ADF&G and USFWS.

____ Mobilize wildlife capture and stabilization equipment stored at stabilization sites.

____ Initiate wildlife capture with contractors in coordination with wildlife agencies.

____ With Operations and wildlife agencies, assist in determining whether Operations should collect carcasses.

____ Send advisories to Operations regarding restrictions near sensitive wildlife areas, if needed.

____ Receive regular reports and recommendations from field personnel.

____ Determine configuration of wildlife response team, as needed.

____ Assess the spill's impact on fish and wildlife for the Environment Unit Leader, including hourly updates.

FIGURE 1-13 WILDLIFE UNIT LEADER'S CHECKLIST FOR EARLY ACTIONS

1.6.10 Shoreline Response Plans

1.6.10.1 Shoreline Cleanup Techniques

The selection of an onshore cleanup technique would be dependent upon a variety of factors, including:

- Characteristics of the oil (i.e., fresh or weathered)
- Characteristics of the slick (i.e., mobile or beached)
- Shoreline type
- Configuration of the shoreline
- Degree of oiling
- Area extent of oiling
- Sensitivity of the shoreline area, particularly as it related to the use of the area by wildlife

The benefits of intrusive treatment techniques must be measured against natural cleaning processes that physically remove and degrade residual oil on the shorelines. Significant human activity may cause environmental stress; therefore, the scale of human effort required is an important criterion for determining the applicability of various shoreline cleanup techniques. Enhancing natural recovery processes and achieving a net environmental benefit should be the primary focus.

Half of the techniques described below involve shoreline washing operations. The purpose of shoreline operations would be to mobilize the oil into a cold water deluge stream that would, in turn, carry the oil down the beach face and into the water where it would be contained and recovered. Mobilization of oil would be accomplished by directing a controlled spray of water to an affected shoreline surface or by agitation pockets or pools of oil. Care would be exercised when agitating pockets or pools of oil so as not to erode underlying fine grain materials.

Washing can be performed by using cold water, hot water, or a combination of the two. Cold water washing would be best suited for removing fresh, mobile oil during the early stages of shoreline cleanup operations. However, even during the early stages of response operations, cold water washing may not be sufficient. As a result, areas washed with cold water may require rewashing with hot water to improve the level of cleanliness.

As weathering takes place and oil viscosity increases, hot water washing may be required to remove oil from affected shorelines. It is particularly important to note that hot water would be used for washing only and not to transport oil to minimize environmental impacts. Cold water deluge would be used to transport the oil. In areas where cold water deluge is impractical (e.g., vertical rock faces), the temperature of the hot water could be reduced.

Fabrication times for washing techniques will vary, depending on equipment and labor availability, weather conditions, or incident specific conditions. Other variables include:

- Logistics considerations of equipment, materials, tools, and distance
- Less than favorable working conditions on barges in open air and weather conditions that may affect working period

- Remote locations and access to power sources that may be inefficient
- Housing and shelter for workers
- Work permits and conditions attached
- Availability of suitable materials for use in fabrication projects
- Availability of sufficient skill levels for all aspects of fabrication among available workers
- Variations in platforms and existing equipment that must be handled or modified

The following is a summary of shoreline cleanup techniques that Alyeska may use, and are currently applicable to most types found in Alaska:

- Nearshore recovery of mobile oil
- Flooding and Flushing which includes:
  - Passive collection/manual removal
  - Cold water low pressure wash with cold water deluge
  - Cold water, low pressure wash with hot water high pressure wash and cold water deluge
  - Moderate pressure medium volume hot water wash with cold water deluge
  - High volume low pressure hot water wash with cold water deluge
  - Hot water high pressure wash with cold water deluge
- Driftwood removal
- Bioremediation

Nearshore recovery of mobile oil will be the main technique in the event of a response. Tactics that may be used to achieve this technique are booming, Deadarm Trenching and Sorbent Fences. These tactics are described in Volume 3, Section 4.1.

Flooding and Flushing and Bioremediation shoreline cleanup techniques are described in Volume 3, Section 4.7, “Shoreline Cleanup Techniques.” Additional shoreline cleanup techniques can be found in Alyeska’s *REF-PWS-TP-2012, Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan,* Part 3, SID #10, and *North Slope Shoreline Oil Spill Countermeasures Manual* (Dec. 1994).

Shoreline cleanup techniques should be selected to reduce the environmental impact of the response and to minimize the impact of the spill. A comparison of response methods in different freshwater and wetland environments, based on the environmental impact of each, is provided in “Options for Minimizing the Environmental Impact of Freshwater Spill Response,” NOAA/API, June 1994. This document can be used to aid in the selection of cleanup techniques for a particular site.

As the “Options for Minimizing the Environmental Impact of Freshwater Spill Response” points out, specific spill conditions will dictate the response techniques used, and selection always involves trade-offs. For example, a potentially ecologically damaging but efficient cleanup technique could be used to meet site-specific response goals. Also, techniques may be used early in response because these can be implemented immediately, rather than waiting until ones with lower impact can be mobilized. A method

that has a significant short-term ecological impact may actually produce the lowest long-term ecological impact because it removes the oil quickly. Conversely, the prolonged use of an inefficient, low-impact technique may be more ecologically detrimental than short-term use of a potentially more intrusive approach (e.g., frequent entry into a marsh to replace sorbents versus vacuuming pooled oil).

1.6.10.2 Planning for Shoreline Cleanup Operations

The planning for shoreline cleanup operations may involve a large number of government agencies, consultants, and contractors. During the planning stage, various participants may be involved in:

- Characterization of shoreline types
- Conduct assessments and surveys
- Identification and/or the evaluation of the applicability of shoreline cleanup techniques.

Once an incident has occurred, key issues will need to be addressed, including:

- Identification of sensitive ecological, cultural, and social resources
- Prioritization of shoreline cleanup areas
- Evaluation of general shoreline cleanup techniques and their applicability to affected shoreline areas
- Evaluation of the secondary impacts of shoreline cleanup operations and the identification or resulting resource trade-off

Identification of properly trained cleanup personnel is an important part of the response planning process. Volume 1, Section 3.9, “Oil Spill Training and Exercise Programs,” provides a description of the spill training and drill program.

Identification of the location, inventory, and ownership of response equipment is important for planning for shoreline cleanup operations. Volume 1, Section 3.6, “Response Equipment,” provides a complete listing of all the spill response equipment available for responding to spills on or near the pipeline. Other spill response equipment owned or controlled by Alyeska is listed in *CP-35-2, Valdez Terminal Oil Discharge Prevention and Contingency Plan,* and *REF-PWS-TP-2012, Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan.* Mobilization of equipment stored at the Terminal or in PWS to a spill site may require special arrangements and approvals to avoid jeopardizing spill response at those locations.

1.6.10.3 Agency and Third-Party Participants

Alyeska, as the responsible party, the FOSC, and the SOSC, in carrying out their responsibilities, may rely on a number of agencies for advice and/or assistance, particularly key federal, state, and local government agencies, e.g., cities, villages, native corporations, and other government-related groups, organizations, or associations within the affected area(s).

Refer to *REF-PWS-TP-2012, Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan*, Part 3, SIDS #8, 9, 10, and 11.

1.6.10.4 Assessment Team(s)

If the oil spill affects a shoreline, it will be necessary to perform broad scale and a limited number of site-specific evaluations before cleanup operations commence on the affected shoreline areas. These evaluations can be performed by assessment team(s) that use the Shoreline Cleanup Assessment Technology process.

1.6.10.5 Shoreline Cleanup Assessment Technology (SCAT) Process

Field assessment of oiled shorelines and documentation of shoreline oiling conditions with ground-level shoreline assessment surveys can be part of a SCAT process. This assessment process is commonly used as a reference for standardized terminology and definitions for consistent documentation of shoreline oiling conditions.

1.6.10.6 General Description of Cleanup Techniques

Floodplains and Large Rivers

Cleanup activities on floodplains and large rivers may be initiated simultaneously with containment actions.

Booms and berms are used to divert and contain spills on large rivers. The use of one or more skimming devices is part of the containment and cleanup actions associated with booms and berms. Rocks, boulders, and sand and gravel bars may be covered with a film of oil as the spill flows downstream. Rocks and boulders can be cleaned by hand-scraping or with pressurized equipment. A hand-operated skimmer with a floating head may be used in conjunction with the sorbents. Gravel bars can be cleaned simply by removing the contaminated gravel and debris. Replacement with clean materials may be necessary if the quantity removed is significant. This can be accomplished with front-end loaders, draglines, and backhoes. In order to prevent the removed instream materials from flowing downstream, sorbent booms and pads should be deployed or dispersed around the object being cleaned.

Oil spills occurring on a river from high water in the fall through spring breakup can be treated several ways. Until ice formation is thick enough to support heavy equipment or employ burning, the river should be treated as it is during the summer, using ice diversion techniques where necessary. During midwinter, ice may be thick enough to employ any of the previously mentioned winter cleanup methods. Breakup poses the greatest hazard to personnel and the worst chances for a successful cleanup. On some smaller rivers or channels of large rivers, it might be possible to install steel nets upstream to protect personnel and equipment from debris and ice. Little can be done in the case of an oil spill directly into a major river during breakup, other than possible immediate burning and/or cleaning up oil that might be left on the floodplain as the river subsides.

Large Lakes and Bays

Cleanup activities on large lakes coincide with containment actions.

The primary means of containing and cleaning up spills on large lakes and bays is the use of booms, sorbents, and skimmers. Booms are used for containing and concentrating the oil. Skimmers should be used to remove the oil from the water surface, transferring it to storage for subsequent disposal. Sorbents should be used for spills of small volumes and for final cleanup of large volumes. Self-powered skimmers with onboard storage will be needed if the oil is not concentrated adjacent to the shoreline. Boats pulling boom could also capture oil for pickup by shoreline skimmers and pumps. Oil recovered using frozen barriers and booms during a winter spill could be burned if storage was not available.

Cleanup along the shoreline is done in much the same way as along a river. Contaminated vegetation can be clipped and removed. Sands and gravels can be removed and replaced. Sorbents can be used to pick up small slicks and sorbent booms deployed to clean up continuing seeps of oil.

Creeks, Ponds, and Bogs

Most of the preliminary cleanup in these regions will take place in conjunction with containment actions.

The soil in bogs and marshes is highly porous and will absorb large quantities of oil. In addition, it will not support equipment or prolonged foot traffic, except selectively during the winter. Generally, cleanup operations are limited to the use of sorbents, hand-operated pumps with skimming heads, and small tools. Water flooding may be useful if large amounts of oil have reached a depression and lie beneath the vegetative cover. Permitted in-situ burning may also be a viable option in mechanically sensitive areas.

Shorelines of ponds can be cleaned by hand or with sorbents and hand-operated pumps with skimming heads. Contaminated grasses (except where there are soil erosion constraints) and debris will have to be removed by hand. Creek banks can be treated in much the same way. In addition, if the creek bed is wide enough, front-end loaders and draglines can remove large quantities of contaminated sand and gravel. Small slicks can be removed from the water surfaces with sorbents, small skimmers, booms, and hand-operated pumps with skimming beads.

With the appropriate agency permit or pre-approval, small pools of oil along the banks of creeks and ponds can be burned if no threat is posed to the surrounding vegetation.

Once cleanup operations have begun, large amounts of waste may be generated. Proper management of these wastes is described in Volume 3, Section 4.5, “Recovered Oil Transfer, Storage, and Disposal.”

1.7 NON-MECHANICAL RESPONSE OPTIONS [18 AAC 75.425(e)(1)(G)]

Alaska considers dispersant application, bioremediation, and in-situ burning as three non-mechanical response options. Any one or combination of these options may be considered as the best approach for clean-up of an oil spill.

For information on marine applications on in-situ burning, dispersant application, or bioremediation, review the *REF-PWS-TP-2012, Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan.* Additional requirements and background information are discussed in Volume 1, Section 3.7, "Non-Mechanical Response Information."

1.7.1 Application of Dispersants

Alyeska does not consider this an option at this time; however, with continued research it may be an option in the future. Oil spill responders in government and industry now recognize that freshwater dispersant application effectiveness tests in the laboratory and in the field, toxicity tests, regulations, application protocols, and application experience are relatively scarce, although spills to freshwater are common. Similarly, stockpiles of dispersants and application equipment for emergency protection of freshwater environments are rare in comparison to marine areas.

1.7.2 In-Situ Bioremediation

Prior to initiating full-scale mechanical response operations, an evaluation will be conducted to determine whether or not natural or enhanced recovery of the affected area is a more appropriate response option. The best option to prevent excessive soil erosion and allow development of a satisfactory plant cover may be in-situ bioremediation. The evaluation will be conducted by Alyeska contracted environment and biological resources that have the professional expertise to evaluate and recommend an appropriate response. Their contact information can be found in Volume 1, Table 3-32.

Terrestrial response operations should be approached with caution. Land areas may be severely affected by cleanup operations. A response option to be considered on terrestrial spills is to cultivate by tilling and reseeding or to sod the area or temporarily mulch the area to prevent erosion. Other areas may be left undisturbed until the succeeding season so that proper assessment of the effects of the oil spill can be made.

1.7.3 In-Situ Burning

1.7.3.1 Introduction

This section describes the approval process for in-situ burning and operational considerations for implementing in-situ burning as a response technique. In-situ burning has the potential to remove significant quantities of oil from land and/or water. Evaporation, formation of emulsions, and spreading of oil may rapidly close the window of opportunity for in-situ burning. In addition, the following must be considered before seeking in-situ burning approval for a spill:

- Feasibility of mechanical recovery,
- Human health impacts,

- Burn conditions,
- Safety and fire control, and
- Sensitive resources.

These factors must be evaluated early in a spill response in order to make a decision on whether burning is appropriate and to obtain rapid in-situ burning approval by the FOSC, with SOSC concurrence, if this response technique will provide a net environmental benefit.

1.7.3.2 Immediate Actions

Unified Command – In-Situ Burning as a Response Objective

The Incident Commander, in consultation with the Planning and Operations Sections, must make a decision early in a spill response on whether in-situ burning is appropriate. Factors for the Planning and Operations Sections to consider in making a recommendation to the Incident Commander on in-situ burning are presented below. If the recommendation is to pursue in-situ burning, the Incident Commander must advise the FOSC and SOSC that formal approval will be requested. Unified Command must then make the decision to establish in-situ burning as a response objective.

Planning and Operations Sections – Initial Considerations for In-Situ Burning

The Planning and Operations Sections must consider the feasibility of in-situ burning when making a recommendation to the Incident Commander for spill-specific conditions. In the initial assessment of in-situ burning, the Planning and Operations Sections should consult with the National Oceanographic and Atmospheric Administration (NOAA) Scientific Support Coordinator (SSC) and representatives of the Alaska Department of Environmental Conservation (ADEC) and Environmental Protection Agency (EPA), whenever possible.

Table 1-16 shows factors that should be evaluated by the Planning and Operations Sections in the initial assessment of whether in-situ burning is a viable response technique for spill-specific situations. If potential unfavorable conditions are identified based on these factors, then in-situ burning may not be a viable response technique or mitigation measures may have to be taken to address potential problems. The Planning and Operations Sections need to complete this initial assessment of in-situ burning and provide a recommendation to the Incident Commander as soon as possible during initial response actions. The recommendation to the Incident Commander should be documented.

The process for conducting the initial assessment of the viability of in-situ burning as a response technique is primarily to help the Incident Commander and Unified Command determine whether in-situ burning should be set as a response objective.

1.7.3.3 Approval Process

The *In Situ Burning Guidelines for Alaska*, Revision 1, March 2008 (hereafter called the *In Situ Burning Guidelines for Alaska*) apply to any requests for emergency in situ burning to prevent the spread of spilled oil and minimize environmental damage. The guidelines apply to in situ burns on flat terrain, and on water in marine and inland areas. The guidelines also apply to burns on land in emergencies to reduce

penetration and uncontrolled migration of the oil. Safe distances recommendations in the guidelines apply to flat terrain (i.e., water and land having a low relief relative to the height of the smoke), although the on-scene coordinators may authorize in situ burning in complex terrain (i.e., mountainous) in some circumstances where safe distances are not developed.

The guidelines do not apply to the following burning activities:

- Adding diesel as a burning agent;
- Burning of thin films of oil which will not sustain ignition without a constant application of an independent ignition source; and
- Disposing of oil and oiled material as waste.

These activities would require an ADEC written approval for open burning.

The Alaska guidelines transfer the in situ burning authorization role to the ADEC (SOSC), Coast Guard (FOSC – marine water), and EPA (FOSC – freshwater). The guidelines also transfer the ADEC open burn permit authorization role under 18 AAC 50.030 from ADEC air quality regulators to the State On-Scene Coordinator (i.e., a separate ADEC open burn application is not necessary).

TABLE 1-16 PLANNING AND OPERATIONS SECTIONS, INITIAL IN-SITU BURNING ASSESSMENT GUIDANCE

Spill-Specific Situation	Assessment Factors for In-Situ Burning Situations			Considerations
	Favorable	May Be Favorable	Unfavorable	
Mechanical Recovery				
Containment	Isolated containment in berms or boom. Minimal danger for flash back to source.	Isolated containment in berms or booms. Some danger for flash back to source.	Difficult containment for burn site. Danger for flash back to source.	Containment of a burn site is important to minimize risks of secondary fires and flash back to the spill source or other parts of the spill. Increased danger of secondary fires may be offset by favorable burn conditions. Flashback may be mitigated by burning downwind of the rest of the spill source, but situation must be monitored closely.
Mechanical recovery impact	No impact by in-situ burning on mechanical recovery.	In-situ burning may impact mechanical recovery.	In-situ burning likely hampers mechanical recovery.	Burning may hamper mechanical recovery. Can be mitigated by waiting for winds to change or by temporarily moving cleanup workers to other nearby areas requiring mechanical recovery.
Human Population Impacts				
Population	Limited population.	Some population.	Urban area, high population.	Population exposure risks can be mitigated if the smoke plume trajectory is expected to be away from populated areas.
Health risks	Low risk of smoke exposure.	Moderate risk of smoke exposure.	High risk of smoke exposure.	Smoke exposure risks can be mitigated by evacuating affected populations or waiting for favorable meteorological conditions.
Smoke dispersion	Light winds away from populated areas.	Low wind speed with variable directions.	Low inversion with calm or light winds.	May have to wait for favorable meteorological conditions if the smoke plume would be trapped close to the ground and cause elevated particulates.
Public notification	Public notification easy and evacuation feasible.	Public notification and evacuation a higher level of effort.	Public notification and evacuation difficult.	Evacuations may have to be done door-to-door if notification by radio and TV is not practical. Aerial surveys may be needed to determine location of remote cabins, hikers, campers, hunters, fishers, etc.
Burn Conditions (see Table 1-17 for Optimal Burn Conditions)				
Vegetative fuel load	Low vegetative fuel load (bedrock, alpine, tundra, tussocks, alders, willows, open and closed broad-leafed forests).	Moderate vegetative fuel load (open and closed forest of spruce, birch, and aspen).	High vegetation load (black and white spruce forests with no broad-leafed trees).	Burning in areas of spruces forests is not advisable unless the fire is sufficient distance away from such fuels to lessen secondary fire danger.

TABLE 1-16 (CONTINUED) PLANNING AND OPERATIONS SECTIONS, INITIAL IN-SITU BURNING ASSESSMENT GUIDANCE

Spill-Specific Situation	Assessment Factors for In-Situ Burning Situations			Considerations
	Favorable	May Be Favorable	Unfavorable	
Winds	Light: 0 to 10 mph.	Moderate: 10 to 15 mph.	High: >15 mph.	Meteorological data is available from the National Weather Service. During the fire season, weather data may also be available from fire weather stations in various locations throughout Alaska.
Ventilation factor	>1,000 square meters per second.	600 to 1,000 square meters per second.	<600 square meters per second.	Meteorological data is available from the National Weather Service. During the fire season, weather data may also be available from fire weather stations in various locations throughout Alaska.
Humidity	50% or greater.	35 to 50%.	35% or less.	Meteorological data is available from the National Weather Service. During the fire season, weather data may also be available from fire weather stations in various locations throughout Alaska.
Fire Weather Index	FWI = 9 or less. FWI 9 results in creeping surface fire.	FWI = 9 to 17 FWI 14 to 15 results in low vigorous surface fire.	FWI = 17 or greater FWI 17 results in moderately vigorous surface fire.	FWI is a numerical rating of potential fire frontal intensity.
Terrain	Flat terrain.	Moderately complex terrain (low rolling hills).	Complex terrain (mountains).	Complex terrain makes it difficult to predict smoke plume trajectory. Effects of complex terrain less important with no significant populations near burn site.
Safety and Fire Control				
Accessibility	Accessible location.	Remote location.	Remote location.	Remote locations can make deployment of personnel and equipment difficult. Transportation may only be available by helicopter or boat.
Containment	Isolated containment in berms or boom. Minimal danger to flash back to source.	Isolated containment in berms or booms. Some danger for flash back to source.	Difficult containment for burn site. Danger for flash back to source.	Containment of a burn site is important to minimize risks of secondary fires and flash back to the spill source or other parts of the spill. Increased danger of secondary fires may be offset by favorable burn conditions. Flashback may be mitigated by burning downwind of the rest of the spill source, but situation must be monitored closely.
Fire-fighting equipment access	Ready access to heavy fire-fighting equipment.	Limited access for heavy fire-fighting equipment.	No access for fire-fighting equipment.	Transportation of heavy fire-fighting equipment may be available only by helicopter or boat. Can be offset by favorable burn conditions.

TABLE 1-16 (CONTINUED) PLANNING AND OPERATIONS SECTIONS, INITIAL IN-SITU BURNING ASSESSMENT GUIDANCE

Spill-Specific Situation	Assessment Factors for In-Situ Burning Situations			Considerations
	Favorable	May Be Favorable	Unfavorable	
Available extinguishing agents	Water, foam, and powder available.	Water, foam, and powder available.	Limited availability for water, foam, and powder.	May be limited availability of extinguishing agents if the burn is not located near road or water source. Skids with powdered Purple-K can be brought in by helicopter or boat. May be necessary to arrange aerial drops of extinguishing agents from Alaska Division of Forestry or Alaska Fire Service.
Sensitive Resources				
Nesting birds or migratory wildlife	No nesting in vicinity of burn site. No wildlife in vicinity of burn site.	Limited nesting in vicinity of burn. Limited wildlife in vicinity of burn site, but can be effectively hazed.	Large number of nests in vicinity of burn site. Large wildlife populations in vicinity of burn site and limited hazing effectiveness.	Smoke potential may cause birds to abandon active nests. Refer to *EA-119, Environmental Atlas of the Trans Alaska Pipeline System* to identify potential wildlife in spill area. Permits are needed for active hazing of wildlife.
Vegetation	No unique or sensitive vegetation species. Low potential for long-term vegetation damage.	Few unique or sensitive vegetation species. Some potential for long-term vegetation damage.	Unique and sensitive vegetation species. High potential for long-term vegetation damage.	Refer to *EA-119, Environmental Atlas of the Trans Alaska Pipeline System* to identify vegetation types in spill area. Contact Environment Unit to arrange for an assessment by a vegetation expert, if necessary.
Cultural resources	No cultural resource sites in vicinity of burn site.	May be cultural resource sites in vicinity of spill site.	Cultural resource sites likely in vicinity of burn site.	Contact Environment Unit for information on cultural resource sites and to arrange for an archeological assessment, if necessary.

In Situ Burning Guidelines for Alaska

This section presents an overview of the processes established in the *In Situ Burning Guidelines for Alaska* and the information in this section is taken from the guidelines unless otherwise noted.

ADEC has also established conditions of approval for an in-situ burning application in the event of a spill. These approval conditions are presented in this section.

Approval Process Overview

To receive authorization for in-situ burning, an Application and Burn Plan form must be completed and submitted to the on-scene coordinators in Unified Command. The on-scene coordinators review the application in four steps before authorizing a burn. The FOSC and SOSC may authorize burning when:

- Step 1: Mechanical containment and recovery by themselves are incapable of controlling the oil spill;
- Step 2: Burning is feasible;
- Step 3: The burn will lie a safe distance from human population; and
- Step 4: The authorization may include conditions designed to protect the public health.

The on-scene coordinators use the On-Scene Coordinators' Review Checklist to evaluate the application.

The in-situ burning decision-making process is summarized in Figure 1-14.

The following section presents detailed information on the four steps for authorization of an in-situ burning application.

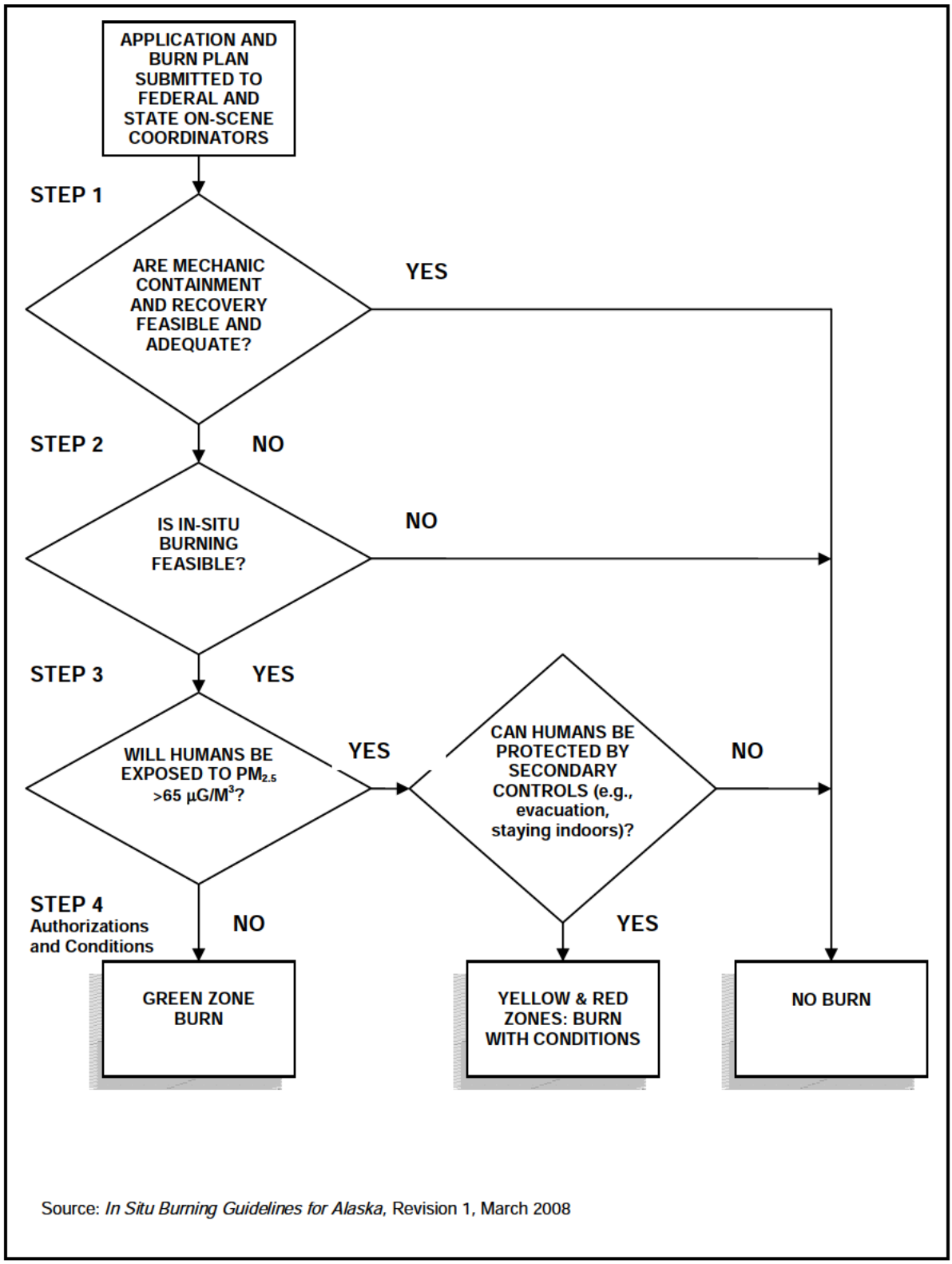


FIGURE 1-14 IN-SITU BURNING DECISION-MAKING PROCESS

Step 1: Mechanical Containment and Recovery

When mechanical recovery is unfeasible or ineffective, removing oil from land or water by in-situ burning may provide significant protection for fish, wildlife, and sensitive environments, as well as commercial, subsistence, historic, archeological, and recreational resources. In-situ burning may (1) prevent the resources from coming into contact with spilled oil; (2) reduce the size of the spill and thus the amount of spilled oil affecting natural resources; (3) allow the environment to recover to the pre-spill state sooner; and (4) provide the most effective means to remove oil from land or water prior to impacts to shorelines or terrestrial habitats, in remote or inaccessible areas, or when containment and storage facilities are overwhelmed.

Step 2: Burning is Feasible

Table 1-17 summarizes the optimal burn conditions in the *In Situ Burning Guidelines for Alaska* for Alaska North Slope Crude Oil. Oil thickness and emulsification have the greatest effect on ignition and burn efficiency. The optimal burn conditions were primarily developed for spills to marine waters, but have applicability to spills to land and/or freshwater. Judgment must be used when evaluating a spill to land or freshwater for in-situ burning against the optimal burn conditions.

TABLE 1-17 OPTIMAL CONDITIONS FOR EFFECTIVE BURNING OF ALASKA NORTH SLOPE CRUDE OIL

Considerations	Conditions for Effective Burning
Oil thickness	Minimum 2 to 3 mm for ignition: thicker layers burn more effectively. Once ignited, minimum thickness to maintain combustion is estimated to be 1 mm. Efficiency (percent of oil in berms or boom removed by burning) increases with increased thickness.
Emulsification	Less than 25% water content. Efficiency and ease of ignition decreases with increasing water content.
Weathering	Relatively fresh oil (less than 2 to 3 days of exposure) is best for ignition. Difficulty of ignition increases with further weathering. Weathering times may vary among crude oil types and weathering conditions.
Wind	Less than 20 knots for ignition
Waves	Waves impact boom effectiveness and combustion primarily by causing splashing. Less than 3 feet in choppy, wind-driven seas is optimal (short-period waves, less than 6 seconds). Less than 5-7 feet in large swells is optimal (i.e., long-period waves, greater than 6 seconds).
Currents	Less than 0.75 knots relative velocity between the fire boom and the water is optimal.
Ice	Variable effects depending upon geometry. Where ice contains the oil and prevents it from spreading, the burn can remove a high percentage of the contained slick. Isolated floes may interfere with booming operations.

Source: In Situ Burning Guidelines for Alaska: Adopted from Alyeska Pipeline Service Company, 1996.

Burn rate is relatively independent of physical conditions and oil type. Oil burns at a rate of about 0.07 gallons/square foot/minute, or about 100 gallons/square foot/day.

The on-scene coordinators do not consider the potential impacts of burn residue when deciding whether to authorize an in-situ burn. The responsible party is required to have a plan for burn residue collection. The volume of residue produced by in-situ burning is much lower than the original volume of oil and is altered in chemical composition and physical properties from the oil. During a burn, the lighter, lower-boiling point hydrocarbons are eliminated, while the heavier, higher-boiling point hydrocarbons are concentrated in the residue. Burn residues are less toxic than the original oil, because the lower-boiling point volatile hydrocarbons, such as benzene, naphthalene, and benzopyrenes are absent. Floating, tar-like residue can typically be removed manually with sorbents, nets, or similar equipment. For in-situ burning on water, burn residues of Alaska North Slope Crude are more dense and viscous than the original oil and may sink after the residue has cooled.

Step 3: Safe Distances from Human Populations

The safe distance separating human populations from an in-situ burn is the downwind radius from the fire at which the smoke $PM_{2.5}$ concentration (particulate matter with diameter of 2.5 microns or less) at the ground diminish to 65 $\mu g/M^3$ (micrograms per cubic meter) averaged over one-hour. $PM_{2.5}$ reflects the size of particulates that pose the greatest human health hazard. If particulate levels are generally below this level, with only minor transitory incursions to high concentrations, there is no reason to believe that unacceptable exposure to populations will occur.

Safe distances in the *In Situ Burning Guidelines for Alaska* are based on the predictions of a computer model, ALOFT-Flat Terrain model 3.04. Computer modeling was used so that real-time air sampling of a smoke plume is not necessary during an in-situ burn. However, visual monitoring of the plume is required and on-scene coordinators may require air sampling for particulate matter during longer-term in-situ burns. Based on the computer modeling, Table 1-18 lists general safe distances separating an in-situ burn and downwind, populated areas in flat terrain. On-scene coordinators may use the prediction in Table 1-19 as safe distances for burns on flat terrain on the North Slope instead of the green zone distances in Table 1-18.

The following zone designations are used by on-scene coordinators for general safe distances:

- **Green Zone:** Burning is generally allowed at a safe distance from the public following Level 1 (Advisory) public notification;
- **Yellow Zone:** May authorize burning following Level 2 (Alert) and Level 3 (Warning) public notifications, warning, and sheltering in-place or evacuation;
- **Red Zone:** May authorize burning following public notifications, warning, and sheltering in-place or evacuation, and if the on-scene coordinators' best professional judgment supports the expectation of $PM_{2.5}$ less than 65 $\mu g/M^3$ for a one-hour average in populated areas.

Note: See Step 4 below for more information on Levels 1, 2, 3, and 4.

TABLE 1-18 SAFE DISTANCES BETWEEN IN-SITU BURNS AND DOWNWIND HUMAN POPULATIONS IN FLAT TERRAIN [1, 2]

Location of Fire	Distance from the Public		
	Green Zone	Yellow Zone	Red Zone
Flat terrain on land	>3 miles	1 to 3 miles	<1 mile
Water <3 miles from shore			
Water >3 miles from shore	>1 mile	Not applicable	<1 mile

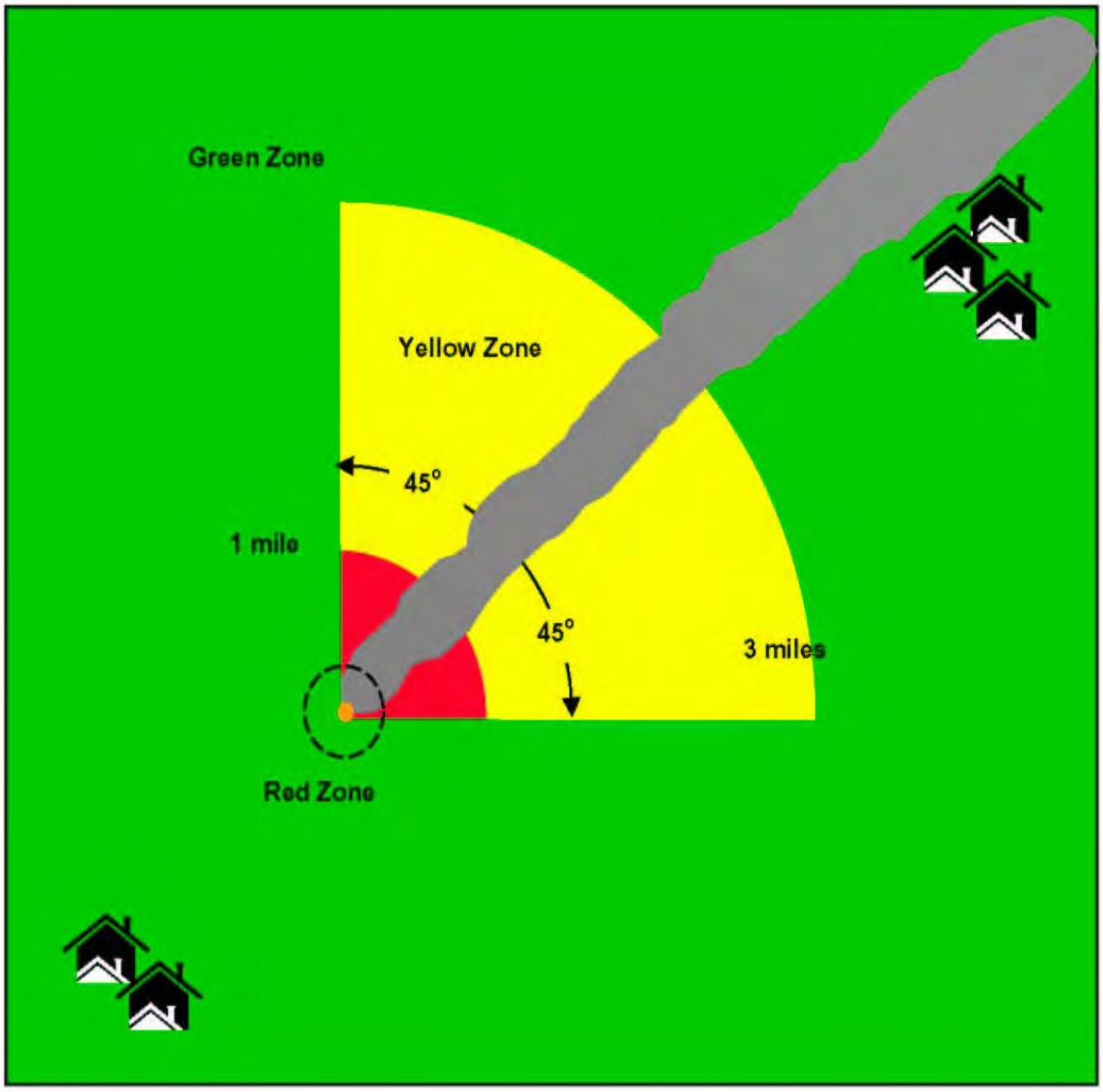
[1] *Applies only if:*
In vicinity of human populations
For a burn of any size from a single source
For simultaneous burns <100 yards apart

[2] *Does not apply if:*
In unpopulated areas
In-situ burns <3 miles upwind of terrain that rises >10 times mixing layer height
For simultaneous burns >100 yards apart

To determine if the safe distance guidance in Table 1-18 applies, use a topographic map to find the terrain rise downwind of the proposed burn and call the National Weather Service for the predicted atmospheric mixing layer height. If the mixing layer height exceeds 10 times the rise of the land above the proposed burn, the area is flat terrain and the safe distance guidance applies. If the mixing layer is less than 10 times the rise of the land above the proposed burn, the area is complex terrain and the safe distance guidance does not apply.

On-scene coordinators may authorize in-situ burning in complex terrain in some circumstances where safe distance guidance has not been developed. The authority is contingent upon the on-scene coordinators' best professional judgment that ground-level $PM_{2.5}$ concentration will remain below 65 $\mu g/M^3$ 1-hour average in populated areas and that other elements of *In Situ Burning Guidelines for Alaska* are followed.

Figure 1-15 shows an aerial representation of safe distance burn zones for in-situ burning on populated flat land, and on water within 3 miles of shore.



The dashed circle shows an example of a 1,000-ft radius site safety zone for workers, determined under a separate site safety plan.

FIGURE 1-15 ZONES FOR IN-SITU BURNS ON POPULATED FLAT LAND, AND ON WATER WITHIN 3 MILES OF SHORE

TABLE 1-19 ALOFT PREDICTIONS OF DOWNWIND SAFE DISTANCES FOR GROUND-LEVEL $PM_{2.5}$ CONCENTRATIONS OF 65 MICROGRAMS PER CUBIC METER OVER FLAT TERRAIN[1]

Burning Area	Season	Regional Source of Meteorological Data	Wind Speed (knots)	Downwind Distance (miles)	
				Land	Water
2,500 square feet	Summer	North Slope	8,16,23	<0.6	<0.6
	Winter	North Slope	8,16	<0.6	<0.6
			23	0.9	<0.6
5,000 square feet	Summer and Winter	North Slope	8,16,23	<0.6	<0.6
10,000 square feet	Summer and Winter	North Slope	16	<0.6	<0.6

Step 4: Conditions of Authorization

On-scene coordinators may include conditions of authorization when approving an in-situ burn. Conditions of authorization will likely require public notification, visual monitoring of the smoke plume, and methods to collect the burn residue. Other conditions to protect the human health may include a trial burn or air sampling for particulate matter for longer-term in-situ burning.

Constant visual observations of the smoke plume's behavior will be required by aerial observation. For authorizations involving inland burns, conditions may require that ADEC and EPA representatives be included on the visual monitoring team. Observers may also be dispatched to populated areas downwind of the burn to perform visual monitoring – this may not be a condition of authorization, but may be a good practice. The burn must typically be stopped if the plume contacts or threatens to contact the ground in populated areas.

The on-scene coordinators may authorize a trial in-situ burn of one fire-resistant boom or containment area full of oil to confirm anticipated plume drift direction and dispersion distances downwind before authorizing the proposed burn.

Conditions of authorization will require that all possible methods to collect the burn residue are taken. The methods for collection of burn residue must be included in the Application and Burn Plan.

Public notification will be required based on the predicted impacts of the smoke plume to populated areas. Avenues of public notification include radio/TV broadcasts, road closures, marine safety zones, notice to mariners, notice to aviators, door-to-door contacts, and other appropriate means. The level of notification depends upon the potential risk of human exposure to smoke and considerations for protecting the public. Descriptions of the levels of notification are summarized below.

Level of Notification	Consideration
Level 1: Advisory	Notify public in green, yellow, and red zones that burning is occurring and the area is to be avoided.
Level 2: Alert	In the yellow zone with human presence, where modeling predicts $PM_{2.5}$ to exceed 65 µg/M3, alert notification may include public notification/warning involving a medical alert to persons with existing conditions that put them at risk to air quality degradation.
Level 3: Warning	Warning notification is public notification/warning in the yellow zone with in-place sheltering instructions for a specified period of time. Level 3 may be implemented at the discretion of the on-scene coordinators or when modeling indicates particulate matter greater than state air quality alert/warning levels.
Level 4: Emergency	Level 4 involves the temporary evacuation of yellow or red zones at the on-scene coordinators' discretion. This is the most stringent and extreme measure of public notification/warning and is only anticipated to be used to relocate a small number of people for a short period of time. The authority to order such an evacuation is vested in local government, or if no local government exists, state officials.

In-situ burns authorized in accordance with the *In Situ Burning Guidelines for Alaska*, using a safe distance would not ordinarily require Level 2, 3, or 4 notifications. These notifications are typically a contingency if the plume does not dissipate as modeled.

ADEC Conditions for In-Situ Burning

In a May 8, 2001 letter, ADEC notified Alyeska that approval for an in-situ burning application in the event of a spill would be subject to the following conditions:

1. Approval will be for the date specified on the approval. Continued in-situ burn operations shall be subject to daily review and approval by the SOSC. This permit may be terminated by the SOSC at any time.

2. In-situ burn operations shall not inhibit or impact mechanical recovery operations.

3. Applicant shall perform visual monitoring to ensure the operation and smoke plume is conducted as projected and will not impact either human populations or the mechanical operations. The applicant shall ensure that the monitoring team includes a representative from the State of Alaska to monitor the burn.

4. In-situ burn efficacy observations and visual monitoring reports should include the amount of oil burned, the location of the burn, the time and duration of burn, the boom condition, wind direction, plume characteristics and amount of burn residue collected. These reports shall be submitted to

the Department on a daily basis, no later than 12:00 noon the day following the burn, for consideration in approval for continued burning operations.

Application and Burn Plan

An example of the Application and Burn Plan for Scenario 3, Sag River, is included as Figure 1-16. The Application and Burn Plan for in situ burning approval is completed by the Environment Unit, in consultation with Operations and Safety personnel, based on spill-specific conditions. The NOAA SSC and ADEC and EPA representatives should also be consulted, whenever possible, during the completion of the Application and Burn Plan.

The completed Application and Burn Plan is forwarded by the Environment Unit Leader to the Incident Commander for signature and submittal to the Federal and State On-Scene Coordinators.

On-Scene Coordinators' Review Checklist

The Federal and State On-Scene Coordinators' authorization guidelines for in-situ burning are provided in the On-Scene Coordinators' Review Checklist (see Figure 1-17). The On-Scene Coordinators' Review Checklist is used by the FOSC and SOSC to evaluate a submitted Application and Burn Plan against the requirements in the *In Situ Burning Guidelines for Alaska*. Figure 1-16 is included as an example for Scenario 3, Sag River.

It is not necessary for the Environment Unit to send a completed On-Scene Coordinators' Review Checklist to the Incident Commander with a completed Application and Burn Plan, but the checklist should be completed to the extent possible prior to submittal of the application. The purpose of completing the checklist is to anticipate the actions of the FOSC and SOSC and be prepared to respond to questions and concerns about the in-situ burning application.

1.7.3.4 Operations Burn Plan

Figure 1-18 contains an Operations Burn Plan Template to be used as a guide for preparing a spill-specific burn plan. Text in the plan either describes spill-specific information that must be provided or suggests text to be included in the plan. The Operations Burn Plan is submitted with the Application. It has been developed to be consistent with the Application. Information developed for the application in many cases can be transferred into the Operations Burn Plan. The Operations Burn Plan is intend for use by the Operations Section, and in particular the In-Situ Burn Task Force(s) to ensure that burn operations are clearly understood.

1.7.3.5 Operations Site Safety Burn Plan

Figure 1-19 contains an Operations Site Safety Burn Plan. The site safety burn plan is a generic plan that may be applicable for many situations involving in-situ burning. A spill-specific Operations Site Safety Burn Plan is submitted with the Application and Burn Plan. The purpose of the site safety burn plan is to provide participants in an in-situ burning operation with the necessary information to be able to conduct the response in a safe manner.

Appendix 1: Application and Burn Plan

In Situ Burning Guidelines for Alaska

Incident Name: Scenario 3 - Sag River

Incident Location: PLMP 80.7 (release point)

Incident Date: Summer - June 5

Incident Time: 1100

Date Prepared		Operational Period	
6/5/2011		Date	Time
Time Prepared	Start:	6/5/11	1930
1430	End:	6/5/11	2200

Title of Applicant: Alyeska Pipeline Service Company

Address: P.O. Box 196660, Anchorage, AK 99519-6660

Affiliation: Owner

Phone: (907) 787-8700 Fax: _____

PART 1

Potential Burn Location PLMP 67, along Sag River

Site Description east bank of Sag River

Latitude _____

Longitude _____

Type of Incident (check one):

_____ Grounding
_____ Transfer Operations
_____ Explosion
_____ Collision
_____ Blowout
✓ Other underground pipeline leak

Product Released (check one):

✓ North Slope Crude
_____ Cook Inlet Crude
_____ Residual/Bunker Oil
_____ Diesel #2
_____ JP4
_____ Other _____

Estimated Volume of Released Product:

_____ gallons, or
1,500 BBL

Estimated Volume of Product That May Potentially be Released:

NA gallons, or
_____ BBL

Release Status (check one):

✓ Continuous
_____ Intermittent
_____ One time only, now stopped

If Continuous or Intermittent, estimated Rate of Release:

_____ gallons, or
per hour/500 BBL

Estimated Surface Area Covered (square miles)
At Time of Application 3 miles downstream of spill site

If inland, identify/describe:.

- Vegetative cover at burn site (e.g., wetlands, grasslands, shrublands, forest, tundra, non-vegetated)
- Fire danger rating at and near the burn site (see Appendix 6)
- Whether burn is on permafrost
- Any ignitable vegetation near the burn
- Any structures/buildings near the burn

Why is mechanical recovery alone **inadequate** for spill response? high water levels, moving ice, and river velocities

Consider the spill size, forecasted weather and trajectories, amount of available equipment, time to deploy, and time to recover. _____

Will you use mechanical recovery in conjunction with in situ burning? yes no

Have you evaluated dispersants? yes ✓no

Will you use dispersants in conjunction with in situ burning? yes ✓no

Why is in situ burning preferred? _____
No suitable location for mechanical recovery; river is in break up. Suitable locations will still be considered.

Example

FIGURE 1-16 APPLICATION AND BURN PLAN (PART 1 OF 4)

Appendix 1: APPLICATION AND BURN PLAN
In Situ Burning Guidelines for Alaska

PART 2

Did source burn? yes ✓no
Is source still burning? yes ✓no

Is product easily emulsified? yes ✓no

Is product already emulsified? (check one)
_____ No
__✓__ Light emulsion (0-20%)
_____ Moderate emulsion (21-50%)
_____ Heavy emulsion (>50%)
_____ Unknown

Estimated Percent Oil Naturally Dispersed and Evaporated Within First 24 Hours: 10 percent

Check boxes and enter wind values in the following table:

	Current Conditions	12-hour Forecast	24-hour Forecast
Clear	✓	✓	
Partly cloudy			✓
Overcast			
Rain			✓
Snow			
Fog			
Wind Speed (kt)	Calm	Calm	Calm
Wind Direction (from)	NE	NE	NE

Percentage Ice Coverage (check one):
_____ No ice present
__✓__ <10%
_____ 11-30%
_____ 31-50%
_____ 51-100%

Tidal state at 1430 o'clock (check one):
__✓__ Slack tide
_____ Incoming (flood)
_____ Outgoing (ebb)

✓ **Attach a graph** with tidal information for three tidal cycles.

Dominant current (not drift):
Speed (knots) 4.0 - 5.5 mph
Direction (to) SW

Current Speed (knots) Relative to the Containment Boom .75 knots or less to minimize entrainment

Note: Current speed relative to the fire boom should be .75 knots or less to minimize entrainment.

Sea State (check one):
__✓__ Calm
_____ Choppy
_____ Swell

Waves (estimate height in feet) NA

Does your site safety plan cover this in situ burn plan?
✓yes no

Will response workers be briefed on the site safety plan before burning? ✓yes no

Are the responders trained and equipped with safety gear?
✓yes no

✓ **Attach an ICS 204 form, or similar document**. On it, list the following equipment you will use:

Vessels
Aircraft for ignition and aerial observation
Lengths of fire boom
Residue containment and removal equipment
Fire fighting equipment
Ignition systems
Burn promoters
Communications systems
Air/plume monitoring equipment.

Example

FIGURE 1-16 APPLICATION AND BURN PLAN (PART 2 OF 4)

Appendix 1: APPLICATION AND BURN PLAN
In Situ Burning Guidelines for Alaska

Proposed Burn Date and Time 6/5/11, 1930

Describe how you intend to carry out the burn.

Helitorch pockets of oil along the east bank of the Sag River in side channels (3 miles downstream from source).

Check one:

✓ Ignition is away from source after containment and movement of the oil to safe location (i.e., controlled burn).

_____ Ignition of uncontained slick(s) is at a safe distance from the source.

_____ Ignition is at or near source without controls.

How will you ignite the oil?

Helitorch, mobilized from a helicopter

Enter the volume of oil you expect to burn:

Fire No.	Oil Volume (BBL__ or Gal__)	Fire Duration (Hrs__ or Min__)
1	60	1.0
2	60	1.0
3	60	1.0
4		
5		
Attach a list for more fires.		
Total Vol.:	180	

How many simultaneous burns are planned?

three

What distance will separate simultaneous burns?

one-half to one mile

Are you planning sequential or repeat (not simultaneous) burns? yes ✓ no

Estimated area of oil in uncontrolled burn (square feet) NA

Describe your ability and procedures to extinguish the burn if necessary or directed to do so.

Two 40# fire extinguishers

PART 3

✓ **Attach a chart with a distance scale**. Show estimated spill trajectory and landfalls, with time. Show the location and distance of your proposed burns relative to the following features:

1. Source:
   Location PL MP 80.7 release point (Ref: Figs SAGR.1 and SAGR.2)
   Distance from Burn (miles) three
2. Ignitable slicks:
   Location NA
   Distance from Burn (miles) _____
3. Nearest Land (burns on water) or Non-Flat Terrain (burns on land):
   Location pockets of oil trapped along east bank of Sag River
   Distance from burn (miles) adjacent

Nearby Populated Areas (i.e., one or more non-spill-related people present):

Location NA - remote location along Dalton Highway
Distance from Burn (miles) _____

Location _____
Distance from Burn (miles) _____

Location _____
Distance from Burn (miles) _____

For Inland Burns consider
- Ignitable vegetation
- Structures/buildings
- Areas with Fire Danger Rating of extreme, very high, or high
- Nearest airport
- Alaska Class I Area (see Appendix 4)

4. Attach a drawing showing your mechanical recovery and in situ burning equipment configurations.
5. For burns potentially impacting populated areas, provide an air monitoring plan in accordance with the SMART protocols.
6. Identify whether any Class 1 Areas (Appendix 4) will be impacted.

Example

FIGURE 1-16 APPLICATION AND BURN PLAN (PART 3 OF 4)

Appendix 1: APPLICATION AND BURN PLAN
In Situ Burning Guidelines for Alaska

PART 4

How do you plan to collect burned oil residue?

Residue will be caught in boomed areas around burn sites; collected with fine mesh nets.

How do you plan to store and dispose of burned oil residue?

Residue will be stored in clear plastic bags until ultimate disposal outside of Alaska.

For inland burns, how do you plan to address post- burn erosion if applicable?

NA

Describe plan for eliminating risk (if any) of accidental (secondary) fires (e.g., structures/buildings and/or vegetation).

Risk of accidental burn is low or non-existent; the only potential risk is vegetation along the river bank. Fire will be continually monitored by Fire Watch.

Will the burn affect visibility at downwind airports within 20 miles?

No nearby airports; affects are temporary

Signatures

Signature of Applicant

Alyeska Pipeline Service Company

Printed name of Applicant

Date and Time Submitted to Federal and State On-Scene Coordinators

Prepared by: Alyeska ICS Position: IC

Phone: _____

Example

FIGURE 1-16 APPLICATION AND BURN PLAN (PART 4 OF 4)

Appendix 2: FOSC/SOSC Review Checklist In Situ Burning Guidelines for Alaska

Note: If an *in situ* burn is being considered, immediately notify the EPA ARRT representative (unless EPA is the FOSC), the DOI and DOC ARRT representatives, and the USCG Strike Team to provide advance notice of this possibility.

STEP 1: Review of the completed Application to Burn Plan

Is burning an appropriate response option, when considering mechanical containment and recovery and/or dispersant use?	✓yes	no

STEP 2: Determine feasibility of burning

Will the oil become 2 to 3 mm thick?	✓yes	no
Is the oil relatively fresh (less than 2 or 3 days of exposure)?	✓yes	no
Does the oil contain less than 25 percent water?	✓yes	no
Is visibility sufficient to see oil and vessels towing boom, and suitable for aerial overflight for burn observation?	✓yes	no
If burning may involve darkness or poor visibility, can the burn be completed safely and well away from any populated areas or other sensitive resources?	✓yes	no
Is wind less than 20 knots?	✓yes	no
Are currents less than 0.75 knots relative to the boom?	✓yes	no
Are waves less than 3 feet in choppy, wind-driven seas or less than 5 to 6 feet in large swells?	✓yes	no
Does the responsible party have a site safety plan for this incident that specifically addresses the proposed burning operations?	✓yes	no
Will response workers be briefed on this plan before burning starts?	✓yes	no
Are personnel trained and equipped with safety gear?	✓yes	no
Is a communications system available and working to communicate with and between aircraft, vessels, and control base?	✓yes	no
Are operational and environmental conditions feasible for burning?	✓yes	no
Can the fire be extinguished and are the procedures for addressing this contingency adequate?	✓yes	no
Will the burn meet the operational criteria for: the next 24 hours?	✓yes	no
the next 48 hours?	✓yes	no

STEP 3: Determine whether burn may be conducted at a safe distance from populated areas.

Burning Near Unpopulated Areas:

To help determine whether an area that could be affected by an in situ burn smoke plume is unpopulated, the Unified Command will consult with land managers and (to the extent practical) land owners of the area to help determine whether there may be individuals using the area for activities including, but not limited to, fishing, hunting, berry picking, boating, backpacking, or conducting research. The Unified Command may require further verification by aerial reconnaissance or some similar means.

Will the smoke plume pass into populated areas?	yes	✓no

If no, proceed to Step 4. If yes, consider the following conditions of authorization.

Example

FIGURE 1-17 FOSC/SOSC REVIEW CHECKLIST (PART 1 OF 4)

APPENDIX 2: FOSC/SOSC REVIEW CHECKLIST
In Situ Burning Guidelines for Alaska

Burning in Flat Terrain Near Populated Areas:

Is the burn in an area near or adjacent to populated areas? yes ✓no

Are local government, land managers, land owners, and/or state emergency service personnel involved in planning for, and if necessary assisting with, public notifications? ✓yes no

On water more than 3 miles from shore, the Green Zone safe distance is 1 mile from populated areas. On land or on water less than 3 miles from shore, the green zone safe distance is 3 miles from populated areas. Burning at a green zone safe distance from populated areas is acceptable. Proceed to Step 4.

The Yellow Zone distance is from 1 to 3 miles downwind of a burn, and within 45 degrees of the smoke plume, when the burn is on land or on water within 3 miles of shore. If the potentially-impacted population can be sheltered in place or evacuated during the burn, proceed to Step 4. If potentially-impacted populated areas cannot be protected, do not authorize burning at this time.

The Red Zone distance is within 1 mile of any burn. Burns within 1 mile of populated areas may be authorized if the potentially-impacted population can be sheltered in place or evacuated during the burn, and if best professional judgment supports the expectation of $PM_{2.5}$ less than 65 micrograms per cubic meter 1-hour average in populated areas. If these conditions can be met, proceed to Step 4. If these conditions cannot be met, do not authorize burning at this time.

Burning when the Safe Distance Is Not Predicted:

The Unified Command determines whether flat terrain exists through the use of topographic maps and on-scene weather information, and input, as appropriate, from the National Weather Service and the Alaska Interagency Coordination Center.

According to best professional judgment, will $PM_{2.5}$ concentrations remain below 65 micrograms per cubic meter 1-hour average in populated areas? ✓yes no

If yes, proceed to Step 4. If no, do not authorize burning at this time.

Notifications and Warnings:

Is it possible to implement Level 1 general notification in the Green Zone? ✓yes no

Is it possible to implement a Level 2 alert notification in the Yellow Zone? ✓yes no

Is it possible to implement a Level 3 warning notification, which includes in-place sheltering? ✓yes no

Is it possible to implement a Level 4 emergency notification, which includes temporary evacuation? ✓yes no

Example

FIGURE 1-17 FOSC/SOSC REVIEW CHECKLIST
(PART 2 OF 4)

APPENDIX 2: FOSC/SOSC REVIEW CHECKLIST
In Situ Burning Guidelines for Alaska

STEP 4: Determine whether environmental and other considerations will be adequately addressed.			
Have potentially-affected natural resources and historic properties been identified and adequately addressed?	✓ yes	no	
If no, document rationale in decision memo.			
Have potentially-affected other considerations (e.g., structures/buildings) been identified and adequately addressed?	✓ yes	no	
If no, document rationale in decision memo.			
STEP 5: Review of consultations and requests for authorization.			
NCP Authorization of Use			
Concurrence Required:			
EPA (FOSC or EPA ARRT representative)	yes	no	conditional
State (SOSC in Unified Command)	yes	no	conditional
Consultation as per the NCP (If other than yes, document how addressed)			
DOI ARRT Representative	yes	no	conditional
DOC ARRT Representative	yes	no	conditional
Other Consultations with Representatives of Potentially Affected Stakeholders:			
Other State and/or Federal natural resource trustees	yes	no	conditional
• Federally-recognized tribes	yes	no	conditional
• Federal, State, and/or local safety and public health agencies	yes	no	conditional
• Land Owners:			
➢ Local (e.g. borough, municipal governments	yes	no	conditional
➢ Private Land owners (e.g. Native corporations)	yes	no	conditional
• Others (e.g., Regional Citizens Advisory Councils, Port Authorities, Area safety/security committees, law enforcement, etc.)	yes	no	conditional
• For a burn that may affect threatened and/or endangered species and/or their critical habitat, DOI-Fish and Wildlife Service* and/or National Marine Fisheries Service ESA Specialists*	yes	no	conditional
• For a burn that may affect historic properties, the FOSC's Historic Properties Specialist.	yes	no	conditional
• For a burn proposed in conjunction with an Outer Continental Shelf Facility, the DOI-MMS Regional Supervisor for Field Operations*	yes	no	conditional

Example

FIGURE 1-17 FOSC/SOSC REVIEW CHECKLIST (PART 3 OF 4)

APPENDIX 2: FOSC/SOSC REVIEW CHECKLIST
In Situ Burning Guidelines for Alaska

STEP 6. Make decision on whether to authorize burn.

Authorization and Conditions:

The on-scene coordinators' decision based on review (check one):

____ Do not conduct in situ burning.

____ In situ burning may be conducted in limited or selected areas (see attached chart).

____ In situ burning may be conducted over the limited period of ____ day(s).

____ In situ burning may be conducted as requested in the application.

____ Other, as specified: _____

Conditions:

1. The burn operations team will visually monitor the smoke plume in accordance with the monitoring plan.
2. The burn operations team will collect the burn residue in accordance with the burn plan.
3. Public notification/warning to people in populated areas who may be in proximity to any of the three safe distance zones in accordance with the notification.
4. Other incident-specific conditions of authorization (e.g., air monitoring in accordance with the SMART protocols) for a burn with the potential to impact populated areas: _____

_____

_____	_____	_____
Signature of Federal On-Scene Coordinator	Printed Name of Federal On-Scene Coordinator	Date and Time
_____	_____	_____
Signature of State On-Scene Coordinator	Printed Name of State On-Scene Coordinator	Date and Time

Prepared By: _____ ICS Position: _____ Phone: _____

Example

FIGURE 1-17 FOSC/SOSC REVIEW CHECKLIST (PART 4 OF 4)

OPERATIONS BURN DESCRIPTION

Location(s): Specify the location(s) of the burning operations, including latitude and longitude of each burn.

Burn Site(s) Description: Describe the characteristics of each burn site (e.g., terrain type, soils, vegetation, and other relevant features).

Description of Burn Operations: Provide a brief description of how the burn operations will be carried out (e.g., controlled burn of oil in fire boom, containment berms, or other natural containment barriers at a safe distance from the source of the oil or uncontained burn of the oil at a safe distance from the source) and method that will be used to ignite the oil (e.g., manual ignition on the upwind side of the containment area or Heli-torch igniter with gelled fuel).

Volume of Oil to be Burned: Estimate the volume of oil that will be burned and the duration and time period for burn(s). If multiple fires are planned, complete the following table and provide the information for each separate fire:

Fire No.	Oil Volume (BBL or Gal)	Fire Durations (Hours)	Time Period (Hour to hour)
1			
..			
n			
Total			

Provide information on how many simultaneous burns are planned and the distances that will separate simultaneous burn. Provide information if sequential or repeat (not simultaneous) burns are planned.

Surface Area of Oil to be Burned: Estimate the surface area of contained and uncontained oil to be burned.

FIGURE 1-18 OPERATIONS BURN PLAN TEMPLATE (PART 1 OF 6)

PRE-BURNING OPERATIONS

Notifications: Before beginning a burning operation, potentially affected populations will be notified of the time and location of the scheduled burn event, the possible health effects, which members of the population should be most concerned, and recommended actions for the potentially affected populations. The FOSC and SOSC determine the notification level and the type of public notification/warning to be given (e.g., advisory that burning is occurring and areas to be avoided, medical alert to persons with existing conditions, in-place sheltering instructions, evacuation for a short time period, etc). Incorporate the notification requirements specified in conditions of authorization by the FOSC and SOSC into this subsection.

The following communications channels are to be used to notify affected populations of the burning operations and expected plume trajectory:

- Identify the specific newspapers, radio, and television stations that will be asked to announce the planned burn operations and incorporate them into this bullet item.
- Notice to mariners

  If the smoke plume trajectory includes the marine environment, ask the U.S. Coast Guard to issue a notice to mariners announcing the burn and the zone in which unauthorized boats would not be allowed. Document the contact and that the notice was provided here.
- Notice to Aviators.

  Ask the Federal Aviation Administration to issue a notice to aviators announcing the burn and the zone in which unauthorized aircraft would not be allowed. Document the contact and that the notice was provided here.
- Overflight Downwind of Burn Site(s)

  The area downwind of the burn site(s) is to be flown over by aircraft to determine whether additional persons would be affected by the burn. If persons are sighted, they would have to be notified by radio, boat, or aircraft and a decision made by the FOSC and SOSC if evacuation was necessary.

Site Preparations: Describe any site preparations that need to be made for the burning operations. Burning operations are to take place at a safe distance from the pipeline and related facilities. If necessary, a buffer between the burn area(s) and the pipeline will be constructed. Heavy equipment may be used on-site to build or modify containment berms.

If the containment area is near a stream, water pumps may be deployed near the stream to provide water for control purposes. A temporary use permit from the Alaska Department of Natural Resources(ADNR) is required if the water use is expected to be more than 5,000 gallons per day, is expected to last more than 9 days, or uses more than one source for the water supply. A Title 41 Fish Habitat Permit may be required from ADNR for pumping water from fish streams. Check *EA-119* for fish stream lists and with the Environment Unit to determine if permits are necessary.

FIGURE 1-18 OPERATIONS BURN PLAN TEMPLATE (PART 2 OF 6)

Oil Containment: Describe the methods to be used for containing oil to be burned (e.g., fire boom, earthen containment berms, uncontained etc.).

For fire boom, describe the boom configuration and operations (e.g., a fire boom anchored on one end to the shore and attached to a vessel to maintain a "U" configuration in the slick or 2 vessels to tow fire boom in a "U" configuration through the slick until sufficient oil thickness is present for ignition, including the fire boom length).

For earthen containment areas, describe the containment area, including whether the area is natural containment or is to be constructed. Provide information on how oil is to be collected and kept in the containment area until ignition.

For uncontained burning, describe why the oil cannot be contained and why it is important to ignite the oil (e.g., can be done swiftly without the need to mobilize equipment in a remote area). Describe how the burn is to be controlled to keep it from jumping back to the source or from causing secondary fires.

Site Safety Precautions: An Operations Site Safety Burn Plan will be developed and made available to affected response workers for review. Response workers will be provided with a briefing on the site safety burn plan issues and site-specific conditions prior to initiating burn operations.

The burn will be controlled by the use of water extinguishing agents (AFFF and Purple-K), heavy equipment, and/or earthen material. In the case of burns on water the risk of secondary fires is low.

An Alyeska Fire and Safety representative will be present along with support personnel.

Depending upon the location of the burn site, the ADNR, Division of Forestry or the BLM, Alaska Fire Service will be contacted and advised of the intent to conduct burning operations. The ADNR, Division of Forestry is responsible for providing wildlands fire protection south o(b) (7)(F), (b) (3)); the BLM, Alaska Fire Service is responsible for providing wildlands fire protection for lands north of this milepost. These agencies may assist in the application of fire extinguishing agents.

Access to the burn area will be limited to authorized personnel.

Worker safety will be the first priority for burn operations. Because of the heat, combustion gases, soot, and open flames associated with burning oil, extreme care must be taken to conduct burn operations in a controlled, safe manner to protect worker health and safety. Alyeska will supply burn operations personnel with appropriate personal protective equipment (PPE). Available equipment includes fire-resistant NOMEX outer-garments, half-mask respirators, gloves and liners, safety glasses, boots, and hard hats. All workers directly involved with burning operations will wear protective clothing and proper respirators will be available.

FIGURE 1-18 OPERATIONS BURN PLAN TEMPLATE (PART 3 OF 6)

BURNING OPERATIONS

Preparations: The location and timing of the burn operations must be planned so that safe distances are maintained between potential fire hazards and other operations, such as mechanical recovery. Equipment and personnel should be prepared to move quickly in the event that winds shift unpredictably. In warm and windless conditions, a cloud of vapors may collect near the source of the spill and create an explosion hazard. An assessment should be made of "flash-back" possibilities in such cases.

If there is any doubt, the perimeter of the containment area should be sampled with an explosimeter (combustible gas meter) for monitoring of oxygen and lower explosive limits (LEL) to determine whether combustible levels of vapors are present. Concentrated pockets of vapors may be blown downwind, so activities should be coordinated upwind from the containment area if possible.

The ignition phase of a burn must be clearly understood by participants and involve the following procedures:

- Final clearance must be given by the designated burn supervisor with concurrence of the Operations Section Chief.
- A final radio check must be made with all boats and aircraft if any are involved in the burn. Alyeska's air-to-air VHF communications frequency is 122.8 MHz, and air-to-ground is 122.9 MHz. A ground-to-ground VHF communications frequency will be assigned to burning operations personnel.
- If ignition is to be completed on the ground, the type of igniter, mode of release, and procedures for follow-up ignition attempts must be clearly understood by participants in the immediate areas.

Effective and constant communications among the burn operations personnel is essential.

Ignition

Manual: Contained oil may be manually ignited by using commercial igniters, highway flares, bagged gelled fuel, or fuel-saturated sorbents and paper products. The oil will be ignited from the upwind side of the containment area to prevent "flash-back". If the containment area cannot be safely approached on the upwind side on foot or by small boat, then a Heli-torch igniter will be used in conjunction with a helicopter.

Heli-torch: It may be necessary to use a Heli-torch to ignite a burn. When a Heli-torch is used, the direction of the flight, altitude and speed must be understood by participants in the immediate area and confirmed by radio prior to ignition. Helicopters must maintain a speed and altitude which is safe and appropriate for the prevailing conditions while trying to stay within the optimal performance rating of the Heli-torch.

Effective and constant communications between aircraft and boats or the ground is important. Ground personnel have the lead in signifying readiness for operations to commence.

FIGURE 1-18 OPERATIONS BURN PLAN TEMPLATE (PART 4 OF 6)

Precautions must be taken when preparing the gelled fuel from gasoline or diesel and when refueling the Heli-torch:

- Fill the Heli-torch in well-ventilated areas to allow fumes to dissipate.
- Wear proper safety clothing when using gelled fuel. This includes goggles, dust masks, and gloves. Locate a fire extinguisher in the operating area.
- Pay close attention to minimizing opportunities for sparks while filling, mixing, and dispensing new or gelled fuel. Connect a ground wire to an earth ground. Use a wooden paddle for mixing if performed by hand.
- Wipe up any gelled fuel spills immediately.

If a slick fails to support combustion, it will be necessary to re-attempt ignition. For burns on water, more oil could be herded into the boomed area or the boomed area could be constricted to increase the thickness of the oil before reigniting.

Burn Tactics: Refer to Volume 3, Section 4.1.

Terminating the Burn: Specify the extinguishing agents and equipment (e.g., water, AFFF, Purple-K, etc.) that are intended to be used for extinguishing the burn, if necessary. To extinguish a burn in boom being towed, the oil can be released from the boom and allowed to spread until it is too thin to burn (the potential spread area is possibly as large as ten contained fire diameters) or tow speed can be quickly increased to force oil under the boom. In an earthen containment area, the burn can be smothered with extinguishing agents or soils. In uncontained burns on land, the Division of Forestry and Alaska Fire Service may assist in application of fire extinguishing agents.

After the main burning phase has been completed, spot burning of smaller areas within containment berms may be necessary and make take up to several days or a week, depending upon the size of the burn area. There is the potential that soils could to be tilled to expose more oil for re-ignition.

FIGURE 1-18 OPERATIONS BURN PLAN TEMPLATE (PART 5 OF 6)

POST-BURN OPERATIONS

Burn Residue - Land: Collect burn residue as soon as possible after burn operations have been completed. If a layer of water was present under the oil and the water remains after the burn, the residue should be recoverable using equipment such as, but not limited to, sorbents, boat hooks, screened rakes, pitch forks, trawls, nets, or skimmers.

A site-specific restoration plan may need to be developed to revegetate the burn site.

Burn Residue - Water: After burn operations have been completed, collect burn residue from fire boom using equipment such as, but not limited to, sorbents, boat hooks, screened rakes, pitch forks, trawls, nets, or skimmers. Burn residue within a fire boom can be herded and thickened against the downstream end of the boom if deployed in a “U” configuration to facilitate collection efforts. By completing more than one burn within the same fire boom before collecting residue, the overall amount of residue will be less than if the residue was collected after each burn. Burn residue may also be potential be released from fire booms into secondary collection booms for recovery to make the fire boom available for further burns.

Burn Residue - Storage and Disposal: Burn residue recovered from land or water burning operations will be collected in suitable containers (specify containers, if possible). The burn residue containers will be transported (specify how) to a waste storage area designated in the incident-specific Recovered Oil and Waste Management Plan. Several options are available for management of the burn residue, including injection in the pipeline if it meets or can be processed (e.g., M-I Unit or similar equipment) to meet TAPS injection criteria. Other options available for managing burn residue include incineration for energy recovery or disposal. The burn residue will be stored in designated waste storage areas until the appropriate management method has been identified.

FIGURE 1-18 OPERATIONS BURN PLAN TEMPLATE (PART 6 OF 6)

PART E: BURNING OPERATIONS SITE SAFETY PLAN

Operations Description

Project objectives: To conduct an *in situ* burning operation along the Trans Alaska Pipeline System (TAPS) corridor in conjunction with oil spill response operations in non-marine environments.

Scheduled activities and time period: Burning operations will consist of a controlled burn, utilizing fire booms and/or earthen berms and natural barriers for containment. The contained oil will be manually ignited by using, for example, paper products or sorbents saturated with fuel, bagged gelled gasoline, or highway flares. The oil will be ignited from the upwind side of the containment area to prevent "flash-back" (ignition of the vapors that have been emitted downwind of the source). If the containment area cannot be safely approached on the upwind side on foot or by small boat, then a Heli-torch igniter with gelled fuel will be used in conjunction with a helicopter. Burning will be continuous unless a safety hazard exists. After the fire burns itself out, spot burning of smaller areas within the containment area may be necessary. The substrate may have to be tilted to expose more oil before re-ignition. If the fire needs to be extinguished manually, a land burn will be extinguished using appropriate fire extinguishing agents such as fire foams or dry powder. A burn on water will be extinguished by releasing the oil from the fire boom and allowing the oil to spread to a thickness that is less than the minimum thickness necessary for burning (generally 2-3 mm for fresh crude oil). After the burning operations have been completed, burn residue may be collected.

Background Review

	Preliminary	Complete
Waste characterization:	( )	(X)
Hazard/safety level determination	( )	(X)

Comments: Alyeska-issued work permits may be necessary depending upon site location. Temporary water use permits may be necessary if water is diverted from streams (see Part D of the TAPS Burn Plan). Parts A, B, C, D, and E of the TAPS Burn Plan will be submitted to Federal and State On-Scene Coordinators and approved prior to the commencement of burning operations. The general public will be notified as described in Part D of the TAPS Burn Plan prior to the commencement of burning operations.

FIGURE 1-19 BURNING OPERATIONS SITE SAFETY PLAN (PART 1 OF 6)

Waste Type(s)/Characteristics

Liquid	(X)	Solid	(X)	Sludge	( )	Gas	( )
Corrosive	( )	Ignitable	(X)	Reactive	( )	Volatile	(X)
Toxic	(X)	Radioactive	( )	Unknown	( )	Other	( )

Special considerations and comments: Chemicals likely to be encountered on site include petroleum hydrocarbons (predominantly BETX compounds), extinguishing agents, Sure-Fire fuel-gelling powder, and fuels (e.g., gasoline and diesel).

General Site Description

Location: Near the Trans Alaska Pipeline

Special conditions and comments: Employees will follow Alyeska procedures regarding designated smoking areas and comply with Alyeska drug and alcohol policy.

Hazard Evaluation - MSDSs are attached to this plan

Working around crude oil: Crude oil emits volatile hydrocarbon vapors that pose an inhalation hazard. Inhalation of hydrocarbon vapors should be avoided whenever possible. Coordinate work upwind of spill area whenever possible. Avoid prolonged contact with skin; can pose a hydrocarbon absorption hazard.

Ignition of oil: Volatile hydrocarbon vapors also pose an explosive hazard. Ignited oil poses a heat and burn hazard. The fire produces black smoke that reduces visibility for aircraft in the area. The black smoke is a hazard when inhaled at high concentrations (this hazard is limited to close proximity to the fire). The fire also produces combustion gases, mostly consisting of carbon dioxide, carbon monoxide, nitrogen oxides, and sulfur dioxide, which are not anticipated to be an inhalation hazard due to their projected low concentrations.

Extinguishment of flames: Extinguishing agents such as fire foams and dry powder are a mild irritant to the eyes, skin, and mucous membranes. Prior to use of extinguishing agents, MSDSs will be provided. MSDS for aqueous film-forming foam (AFFF) is attached as an example.

Mixing of gelled fuel (if Heli-torch is to be used): Use of Sure-Fire gelling powder poses a potential dust inhalation hazard; it is an explosive hazard in high-dust concentrations in the presence of an ignition source. Mixing the powder with fuel (usually gasoline) poses a vapor inhalation hazard because the fuel emits volatile hydrocarbon vapors.

Construction of earthen berms: Oiled particulates from soil as airborne dust (created during construction activities) pose potential heavy metal and hydrocarbon inhalation hazards.

Heavy equipment and vehicular traffic: There are physical hazards working around heavy equipment. Also, vehicular traffic may be in the vicinity. Personnel need to remain alert to avoid physical injury.

FIGURE 1-19 BURNING OPERATIONS SITE SAFETY PLAN (PART 2 OF 6)

Safety Equipment and Procedures

Level of protection: ( ) A ( ) B ( ) C (X) D

Additions and modifications: The following equipment will be available and accessible to each employee: fire-resistant Nomex outer-garments, half-mask respirators, combustible gas meters, first aid kits, gloves and liners, safety glasses, boots, and hard hats. Caution/barrier tape, traffic cones, warning signs/devices, and barricades will be used as appropriate.

Special surveillance equipment and materials: An explosimeter (combustible gas meter) for monitoring oxygen and Lower Explosive Limit (LEL) will be available to determine whether combustible levels of vapors are present (activities should be coordinated upwind from containment area).

Decontamination procedures: Cleanse hands and face prior to breaks. Launder all soiled work clothing.

Personal decontamination station(s) (PDS): Wash areas will be available.

PDS equipment, materials, and special facilities: Eye wash and first aid kit will be easily accessible.

Special considerations for controlling burning operations and preventing secondary fires: The burn will be controlled by the use of water, extinguishing agents, heavy equipment, earthen material, or natural barriers. In the case of burns on water, the risk of secondary fires is low.

FIGURE 1-19 BURNING OPERATIONS SITE SAFETY PLAN (PART 3 OF 6)

Operations Plan

Zones of contamination: (X) Known ( ) Projected ( ) Unknown

Comments: Work zones will be designated on site using caution/barrier tape, traffic cones, warning signs/devices, or barricades as appropriate.

Site Entry Procedures

Safety meetings shall be conducted at the beginning of each work shift. Personnel attending and topics covered shall be documented and filed with this Site Safety and Operations Plan. A safety orientation will be provided before the work begins.

In the event of an OSHA-recordable injury and illness, accident, and damage or significant changes to equipment, an Alyeska Fire and Safety officer shall be contacted immediately. In the event of one of the above, an incident report shall be filled out.

Special conditions (e.g., work schedule or limitations): Work areas will be clearly demarcated.

FIGURE 1-19 BURNING OPERATIONS SITE SAFETY PLAN (PART 4 OF 6)

Emergency Procedures

Crude Oil:

Acute exposure symptom(s):	First aid:
1. Eyes - slight to moderate irritation.	Flush with water for 15 minutes.
2. Skin - irritation, redness, edema, drying.	Wash with soap and water.
3. Respiratory - dizziness, irritation of eyes, nose, throat; vomiting; bluish skin; nervous system effects.	Remove to fresh air.
4. Ingestion - irritation of the mouth, throat, and gastrointestinal track; systemic effects.	Do not induce vomiting because it can cause chemical pneumonitis. Call a physician.

AFFF (3% solution in water; used for fire extinguishment):

Acute exposure symptom(s):	First aid:
1. Eyes - mild transient irritation.	Flush with large amounts of water. If irritation persists, seek medical attention.
2. Skin - mild transient irritation.	Wash with soap and water. If irritation persists, seek medical attention.
3. Respiratory - not anticipated to be a problem.	Remove victim to fresh air. Seek medical attention if discomfort continues.
4. Ingestion - irritating to mucous membranes. Large oral dose could produce narcosis.	If patient is conscious, give large amounts of water and induce vomiting. Seek medical help.

Sure-Fire (powder used for making gelled fuel for the Heli-torch):

Acute exposure symptom(s):	First aid:
1. Eyes	Flush immediately with water for at least 15 minutes and call a physician.
2. Skin	Wash with soap and water.
3. Respiratory	Remove victim to fresh air and provide oxygen if breathing is difficult. Get medical attention.
4. Ingestion	Call a physician immediately.

Hospitals/emergency medical center (address/phone no.) Map attached? ( ) Yes (X) No

1. Nearest pump station or local community facility.
2.

Emergency transportation (fire, ambulance, police):

1. Call 911
2. Call Alyeska Security at ext. 8777 (265-8777) or for priority emergencies call ext. 8888 (265-8888)
3.

Emergency routes:

1. Evacuate to nearest road.

FIGURE 1-19 BURNING OPERATIONS SITE SAFETY PLAN (PART 5 OF 6)

Safety/Health Equipment Check-out List

General Safety:

First aid kit	(X)	Eye wash station	(X)
Safety glasses/face shield	(X)	Drinking water	(X)
Safety shoes/gloves	(X)	Tyvek suits/nitrile gloves	(X)
Personal clothing change	( )	Hearing protection	(X)
Wash/decontamination materials	(X)	Other	( )

Specific Safety Equipment:

(X) Respirator: type (dust, cartridge, SCBA, etc.) ½-face respirator with HEPA/OV cartridge

(X) Combustible gas/explosimeter (with oxygen indicator)

( ) Oxygen indicator

( ) Dosimeter badge(s)

( ) Draeger/Sensidyne pump and detector tubes:

(X) Duct tape, brushes, buckets, water, soap, paper towels

(X) Caution tape, traffic cones

( ) Photoionization detector or flame ionization detector

(X) Fire extinguisher in field vehicles

( )

Special condition and comments: In accordance with OSHA requirements, Alyeska personnel are given periodic physical examinations and are evaluated for use of respiratory protection. If any personnel believe that they have suffered an overexposure, they must contact their supervisor immediately. Alyeska personnel on site have completed a general site worker course complying with 8 AAC 10.0101 and have at minimum three days actual supervised field experience. In addition, Alyeska employees have read the Alyeska Corporate Safety Manual and have received training in the following: Hazard Communication, Respiratory Protection, Personal Protective Equipment. Documentation of this training is available through the Alyeska Training Department.

Note: This health and safety plan has been developed for the use of Alyeska personnel only. Alyeska makes this plan available for review by other personnel on a work site; however, this plan does not cover the employees of any other employer on the work site.

FIGURE 1-19 BURNING OPERATIONS SITE SAFETY PLAN (PART 6 OF 6)

1.7.3.6 Air Monitoring

Visual monitoring of smoke plume behavior will be required by an aerial observation team(s) using a plane or helicopter. The aerial visual observation team(s) (if aircraft space allows) should consist of a trained observer, an ADEC representative and/or EPA representative, and an Operations representative. One or more visual observers may also be dispatched to populated areas downwind of the burn that could potentially be impacted to observe whether impacts to humans occur and to report observations to the Environment Unit.

The FOSC and SOSC may require particulate sampling during longer in-situ burns. If particulate sampling is required as a condition of authorization, request that the FOSC call out the National Strike Team which maintains an air monitoring ability. Air sampling should meet applicable provisions of the SMART (Special Monitoring and Applied Resource Technology) protocol for in-situ burning operations.

The Environment Unit is responsible for preparing the visual monitoring plan and for assuring that the monitoring plan meets the ADEC approval conditions for in-situ burning.

Visual monitoring results should be reported to the Environment Unit Leader for the compilation of daily reports for submittal to Unified Command. The monitoring results should be reviewed at least daily with the NOAA Scientific Support Coordinator and ADEC and EPA representatives to evaluate the effectiveness (i.e., impact on human populations and smoke plume direction and dispersion distances) of continued in-situ burning.

Based on the evaluation of effectiveness of the burn operation and the ability to maintain burn ignition, a daily recommendation needs to be provided to Unified Command on whether to continue or terminate in-situ burning. A new *Application and Burn Plan* may need to be submitted for each day of in-situ burning and the visual observation plan may need to be revised.

1.7.4 Open Burning

In Situ Burning Guidelines for Alaska do not apply to the following burning activities:

- Adding diesel as a burning agent;
- Burning of thin films of oil which will not sustain ignition without a constant application of an independent ignition source (e.g., weed burners); or
- Disposing of oil and oiled material as waste.

The ADEC *Open Burning Policy and Guidelines* apply to spill response burning operations not subject to the provisions of the *In Situ Burning Guidelines for Alaska.* Open burning of petroleum-contaminated materials that would generate black smoke is subject to obtaining written ADEC approval and may require public notice. A copy of the Burn Plan Approval Guidance, including information that must be supplied for burn approval are shown in Figure 1-20.

The Environment Unit Leader, in consultation with Operations, is responsible for completing the information requested in the burn approval guidelines. The Environment Unit Leader should also consult with an ADEC representative involved in the spill response.

The completed open burning information is forwarded by the Environment Unit Leader to the Incident Commander for signature and submittal to the State On-Scene Coordinator for approval.

APPROVAL ISSUANCE

Section III-F of the Alaska Air Quality Control Plan lists the requirements for obtaining approval to open burn. ADEC has up to 30 days to issue an approval. Written approval is not automatic but must be evaluated for conformance with the following guidelines.

A contingency plan should be prepared in case of unforeseen changes in weather or other uncontrollable parameters that would affect your burn and the resulting smoke. Persons with approval must curtail their fire if air in the areas is becoming overloaded or local weather factors would create smoke problems, even though no other restrictions have been imposed (i.e., wind moving directly into sensitive areas, inversions, etc.).

If any safety hazard is present, you must extinguish the fire as soon as possible. You will be held legally responsible for any accident or adverse health effects that our because of your open burn.

The guidelines of the burn plan should include the following:

1. Indicate the location, duration, and inclusive dates considered for the burn:

Indicate the type and quantity of material, the condition, and the expected duration of both single events and the entire burn project. Changes or additional information for the burn plan can be discussed at the time of ADEC notification by phone.

2. Identify the location of sensitive features that might be impacted by smoke:

The applicant should list all population centers, including airports, medical facilities, schools (in session), and numbered Alaska highways, that are within an appropriate radius of the project. The “appropriate radius” should include an adequate margin of safety to include all potentially impacted sensitive populations and activities.

3. Indicate how the public will be informed prior to, during, and after the burning:

A successful burn is one in which no complaints are received. The best way to do this is to make sure everyone around you knows when the burn will occur so that they can take steps to either avoid smoke or tolerate it. Your direct contact phone number should be publicized so that public can contact you if need be. In the case of fire training, notify the public through news media.

4. Indicate how you will coordinate with other concerned agencies, including authorities of sensitive features:

Indicate how you will notify all concerned agencies, including authorities in control of sensitive features identified in Item 2 (such as the FAA, State Troopers, military, fire department, adjacent land managers, etc.) who are potentially affected by visibility or adverse smoke impacts prior to ignition.

Indicate if you obtained a permit and notified the Forestry Division of the Department of Natural Resources.

5. Indicate where the weather forecast will be obtained and how it will be used to prevent smoke impacts:

Identify how the weather forecast will be obtained during the open burn. Parameters that should be obtained are the predicted visibility, wind direction, and wind speed.

FIGURE 1-20 ADEC BURN PLAN APPROVAL GUIDANCE (PART 1 OF 2)

6. Indicate how weather changes will be monitored and what will be done to reduce or mitigate smoke impacts if unfavorable weather should occur after ignition:

Indicate how the weather forecast will be monitored throughout the open burn. Identify what you do if a wind shift or other weather change begins to create an adverse smoke impact on sensitive features identified in Item 2. For example, if you expect an inversion to occur during the night, you would put the fire out at the end of the day.

If any safety hazard is present or if requested by the authority of a sensitive feature, you must extinguish the fire as soon as possible.

7. Indicate what will be done to predict smoke dispersion:

Indicate how you will predict smoke dispersion. If a recommended method (smoke bomb, fire test, etc.) fails to indicate that acceptable smoke dispersion will occur, no fires will be ignited. “Unacceptable smoke dispersion” is defined as an unacceptable decrease in air quality for any sensitive feature identified in Item 2.

8. Indicate what will be done to enhance the active fire phase and reduce the smoldering phase:

Indicate what will be done to enhance the active fire phase and reduce smoldering. For example, materials should be stacked in order to enhance oxygen flow to the flame.

9. Indicate how sensitive features will be contacted if visibility decreases:

Authorities having control over sensitive features identified in Item 2 will be notified if visibility is expected to be decreased to less than three miles for greater than 30 consecutive minutes and/or 180 minutes during a 24-hour period. Indicate how you will notify authorities of sensitive features if this occurs. If any safety hazard is present or if requested by the authority of a sensitive feature, you must extinguish the fire as soon as possible.

10. Identify alternative disposal options for materials being open burned:

For fires other than fire fighter training, evaluate alternatives to open burning must demonstrate that open burning is the only feasible alternative. Identify if you looked into other options of disposal, such as marketing timber with a lumber company.

11. Indicate how you will coordinate with air quality authorities having jurisdiction:

Indicate that you will notify ADEC by telephone at least 24 hours prior to ignition Monday thru Friday between 8:00 a.m. and 4:30 p.m. excluding State holidays: (907) 451-5173 (Fairbanks Administrative Clerk), (907) 269-7577 (Anchorage Administrative Clerk), or (907) 465-5100 (Juneau Administrative Clerk). Identify your name, location of burn, contact phone number, what your test burn was like, how long you expect the active fire phase and the smoldering phase to last, and what kind of notification procedure you have done.

FIGURE 1-20 ADEC BURN PLAN APPROVAL GUIDANCE (PART 2 OF 2)

1.8 FACILITY DIAGRAMS [18 AAC 75.425(e)(1)(H)]

1.8.1 Pipeline

Volume 4, Map Atlas, includes the following information:

- An overall pipeline map showing the pipeline and mileposts, communities, pump stations and other pipeline facilities.
- Section Maps showing topographic and aerial photographic detail, the pipeline, direction of flow, culverts, containment site locations, ROW, highways with ROW access points, valve locations, rivers, major streams, existing surface water bodies and other information important to responders.

Volume 3, Tactics, includes the following information:

- Contingency area deployment maps and descriptions containing detailed containment site maps and deployment descriptions.
- Hydrology tables detailing recommended containment actions for rivers and streams based on seasonal expected flow conditions and velocities.

Volume 1, Section 3, Table 3-1 Pipeline Valve Locations, shows the mainline valve types, survey locations, and pipeline mileposts. These mainline valves are also illustrated in *Volume 4, Map Atlas*.

1.8.2 Pump Stations and Pipeline Facility Diagrams

Facility diagrams are arranged to show each pump station's physical layout, access, oil transfer locations, pipelines, and control stations and are illustrated in Figures 1-21 through 1-33. Diagrams for offline facilities are referenced in this section for informational purposes since tankage and piping associated with normal operations have been disconnected, flushed, and isolated as out-of-service. Tank and containment information can be found in Volume 1, Section 3.1. Potential spill information can be found in Volume 1, Section 2.3.

EC-71, Emergency Contingency Action Plan, contains facility piping diagrams, plot plans, and other information specific to individual pump stations and emergency actions, which are not duplicated here.

1.8.2.1 Pump Station 1

- Site Plan and Facility Drainage
  - Figure 1-21
- Plot Plan

  See *EC-71-01, Emergency Contingency Action Plan*, Pump Station 1
  - Figure 4.1, “Pump Station 1 Plot Plan and Building Number Designations”
- Piping Diagrams

  See *EC-71-01, Emergency Contingency Action Plan*, Pump Station 1
  - Figure 4.2, “Isolate Station Configuration”
  - Figure 4.5, “Meter Building, First Floor Emergency Equipment”
  - Figure 4.6, “Meter Building, Second Floor Emergency Equipment”
- Tank and Containment Information
  - Table 2-3
- Potential Spill Sources
  - Table 2-11

(b) (7)(F), (b) (3)

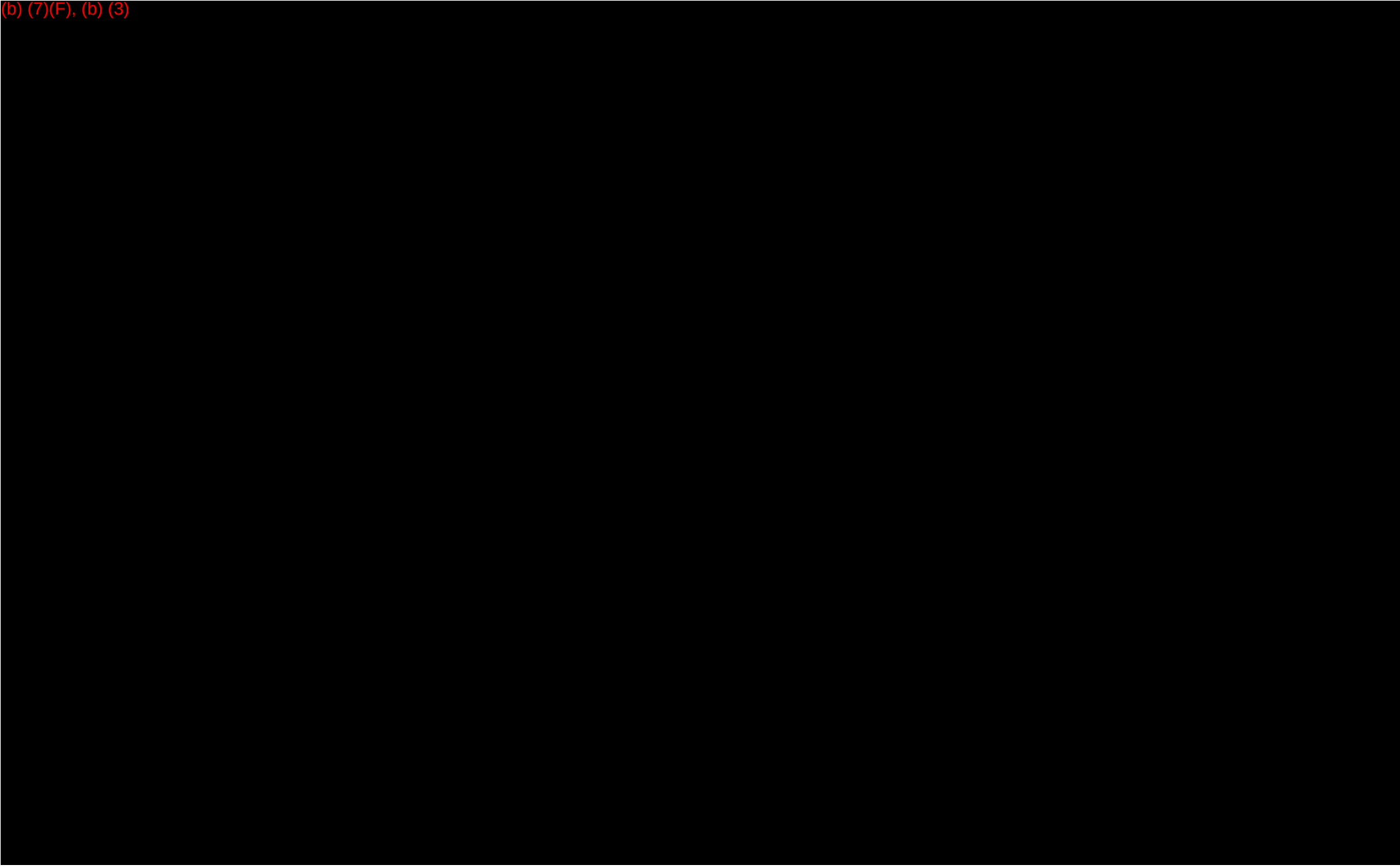


FIGURE 1-21 PUMP STATION 1 CURRENT SITE PLAN AND FACILITY DRAINAGE

1.8.2.2 Pump Station 3

- Site Plan and Facility Drainage
  - Figure 1-22
- Plot Plan
- See *EC-71-03, Emergency Contingency Action Plan*, Pump Station 3
  - Figure 3-1, “Pump Station Plot Plan”
- Piping Diagrams
- See *EC-71-03, Emergency Contingency Action Plan*, Pump Station 3
  - Figure 4.3, “Isolate Station”
- Tank and Containment Information
  - Table 2-3
- Potential Spill Sources
  - Table 2-12

(b) (7)(F), (b) (3)

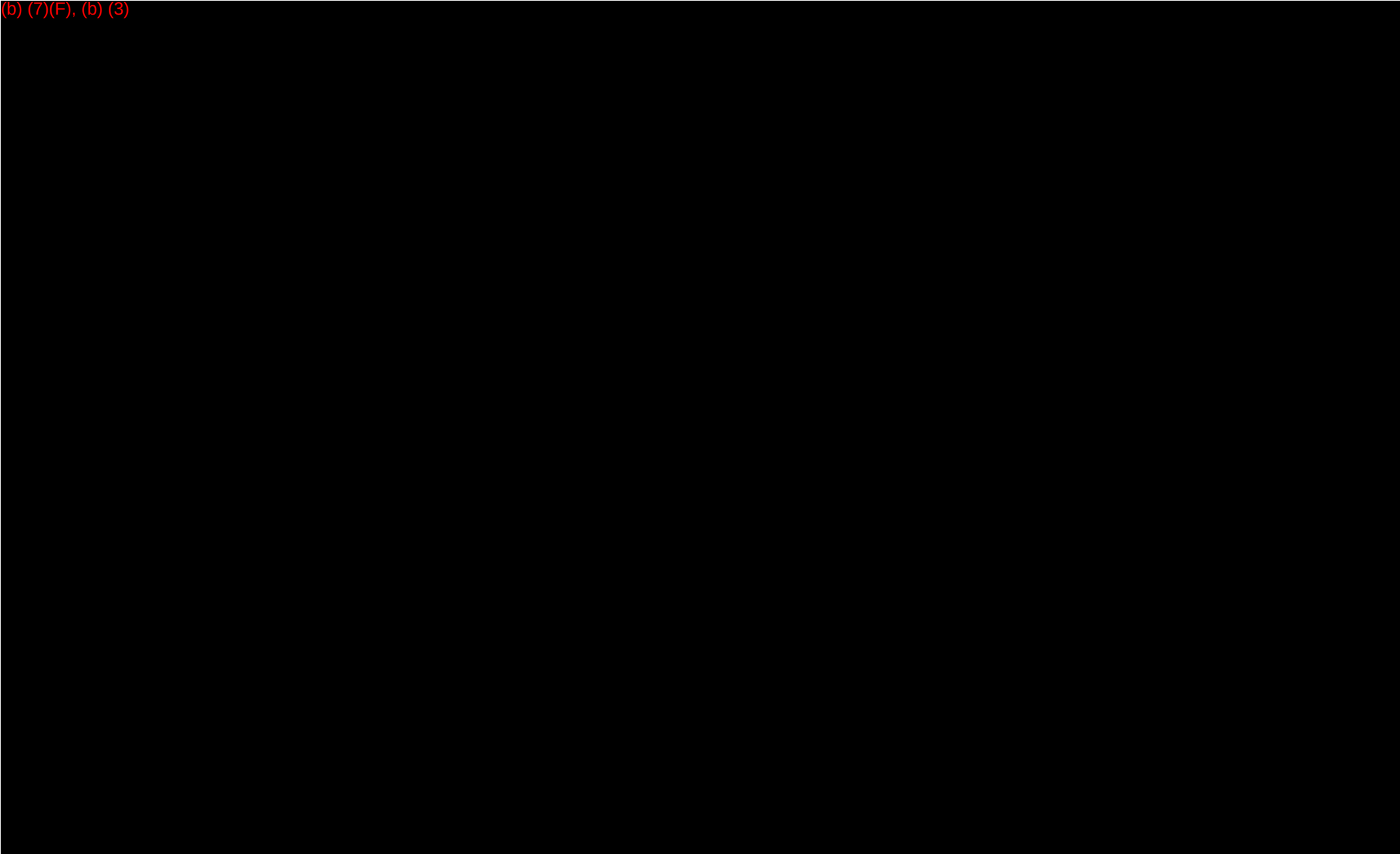


FIGURE 1-22 PUMP STATION 3 CURRENT SITE PLAN AND FACILITY DRAINAGE

1.8.2.3 Pump Station 4

- Site Plan and Facility Drainage
  - Figure 1-23
  - Figure 1-24
- Plot Plan

  See *EC-71-04, Emergency Contingency Action Plan*, Pump Station 4
  - Figure 4.1, “Plot Plan for Pump Station 4”
  - Figure 4.6, “Galbraith Airport Plot Plan”
- Piping Diagram

  See *EC-71-04, Emergency Contingency Action Plan*, Pump Station 4
  - Figure 4.2, “Isolate Station”
- Tank and Containment Information
  - Table 2-3
- Potential Spill Sources
  - Table 2-13

(b) (7)(F), (b) (3)

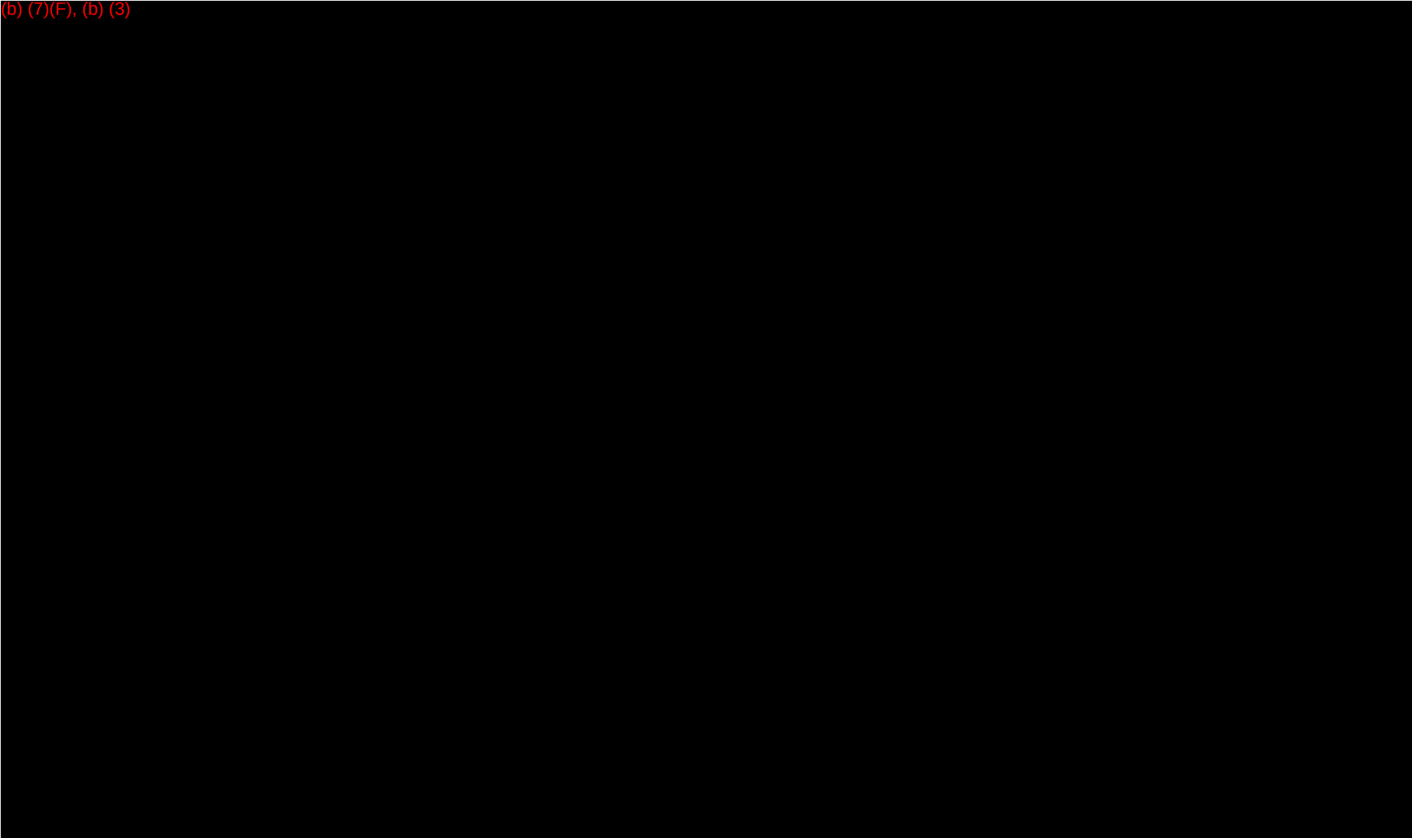


FIGURE 1-23 PUMP STATION 4 CURRENT SITE PLAN AND FACILITY DRAINAGE

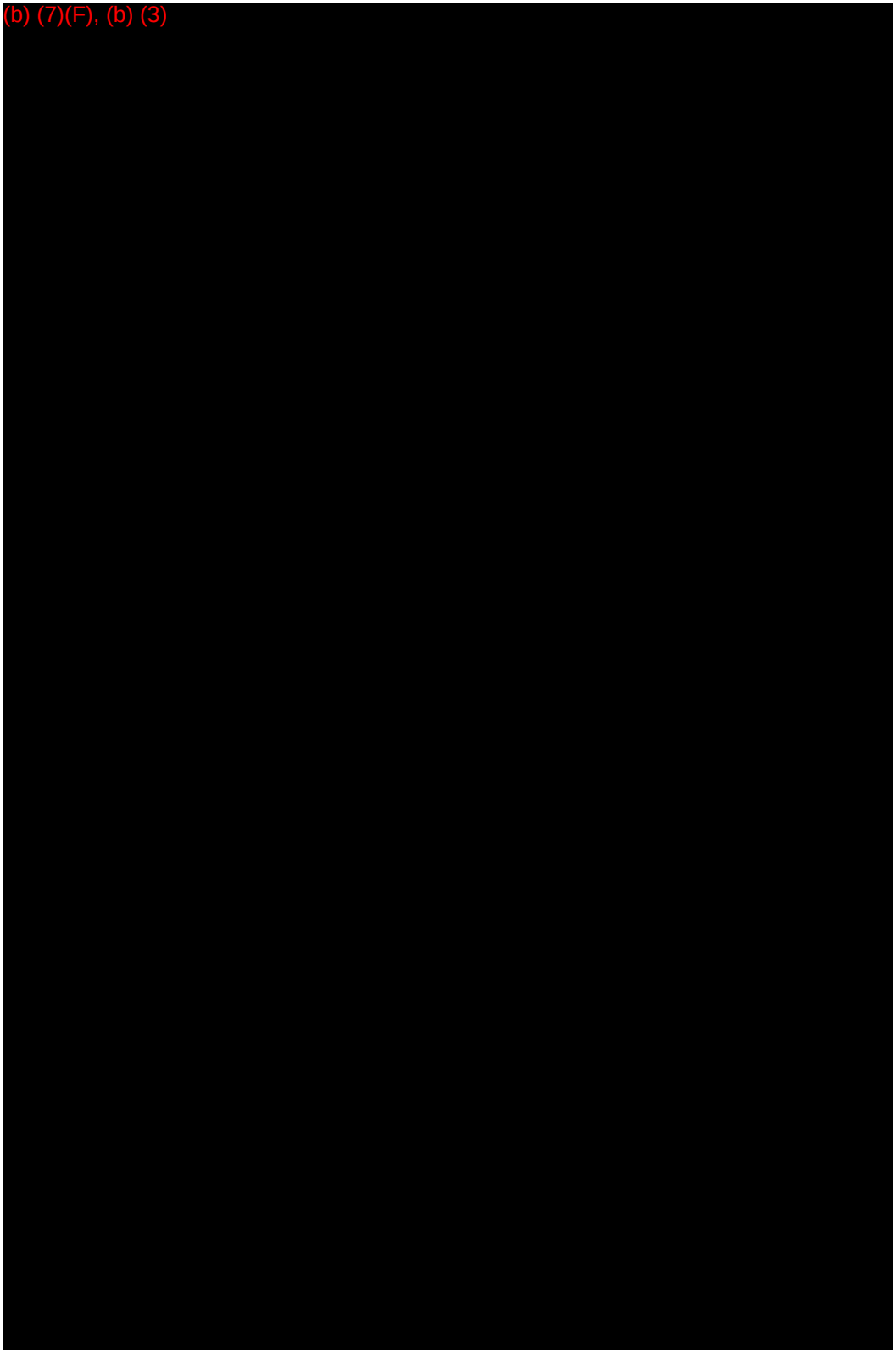


FIGURE 1-24 GALBRAITH AIRPORT SITE PLAN

1.8.2.4 Pump Station 5

- Site Plan and Facility Drainage
  - Figure 1-25
  - Figure 1-26
- Plot Plan
- See *EC-71-05, Emergency Contingency Action Plan*, Pump Station 5
  - Figure 4.1, “Pump Station 5 Plot Plan”
- Piping Diagrams
- See *EC-71-05, Emergency Contingency Action Plan*, Pump Station 5
  - Figure 4.3, “Pump Station 5 Isolate Station”
- Tank and Containment Information
  - Table 2-3
- Potential Spill Sources
  - Table 2-14

(b) (7)(F), (b) (3)

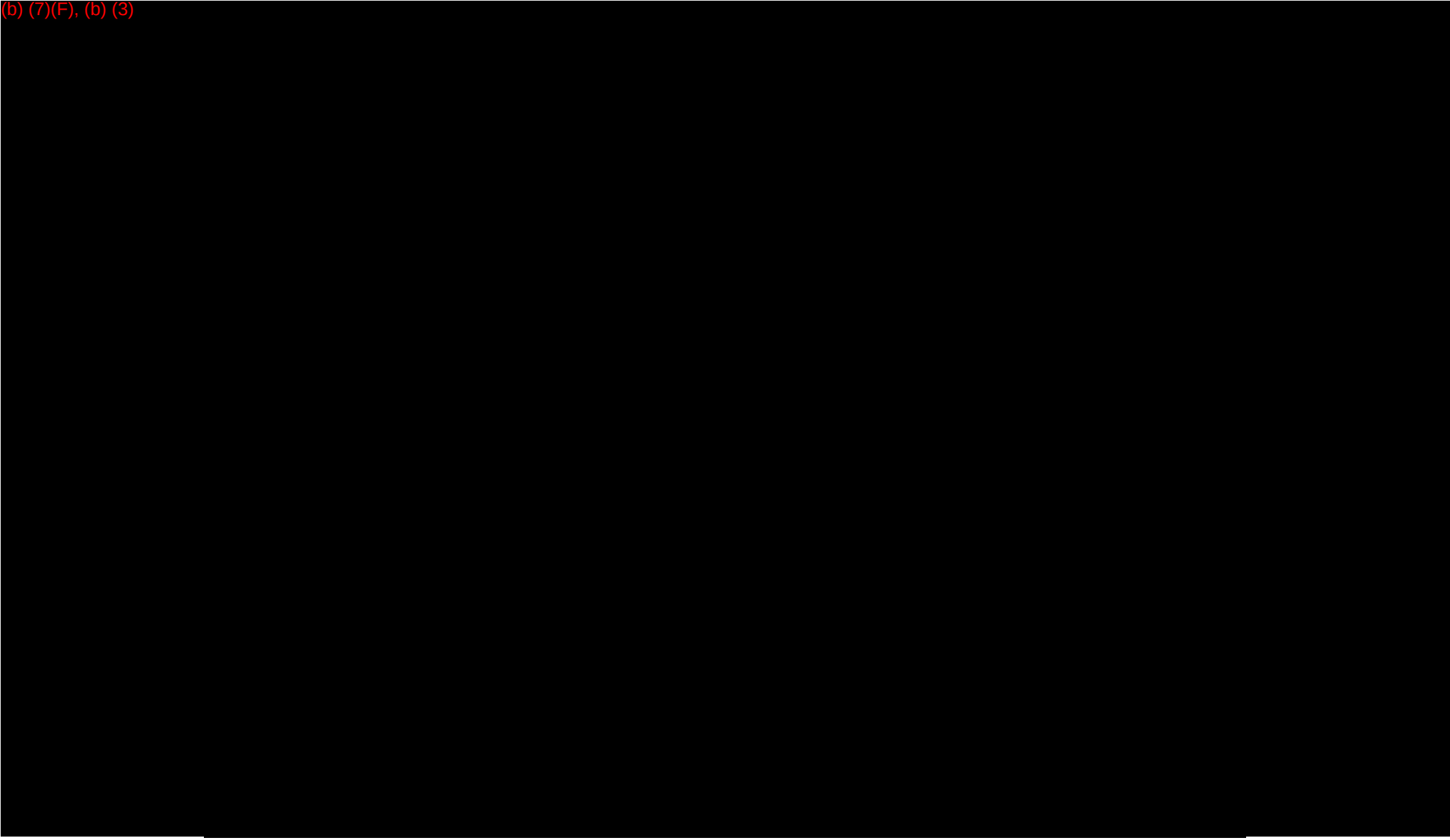


FIGURE 1-25 PUMP STATION 5 / PROSPECT RESPONSE BASE CURRENT SITE PLAN AND FACILITY DRAINAGE

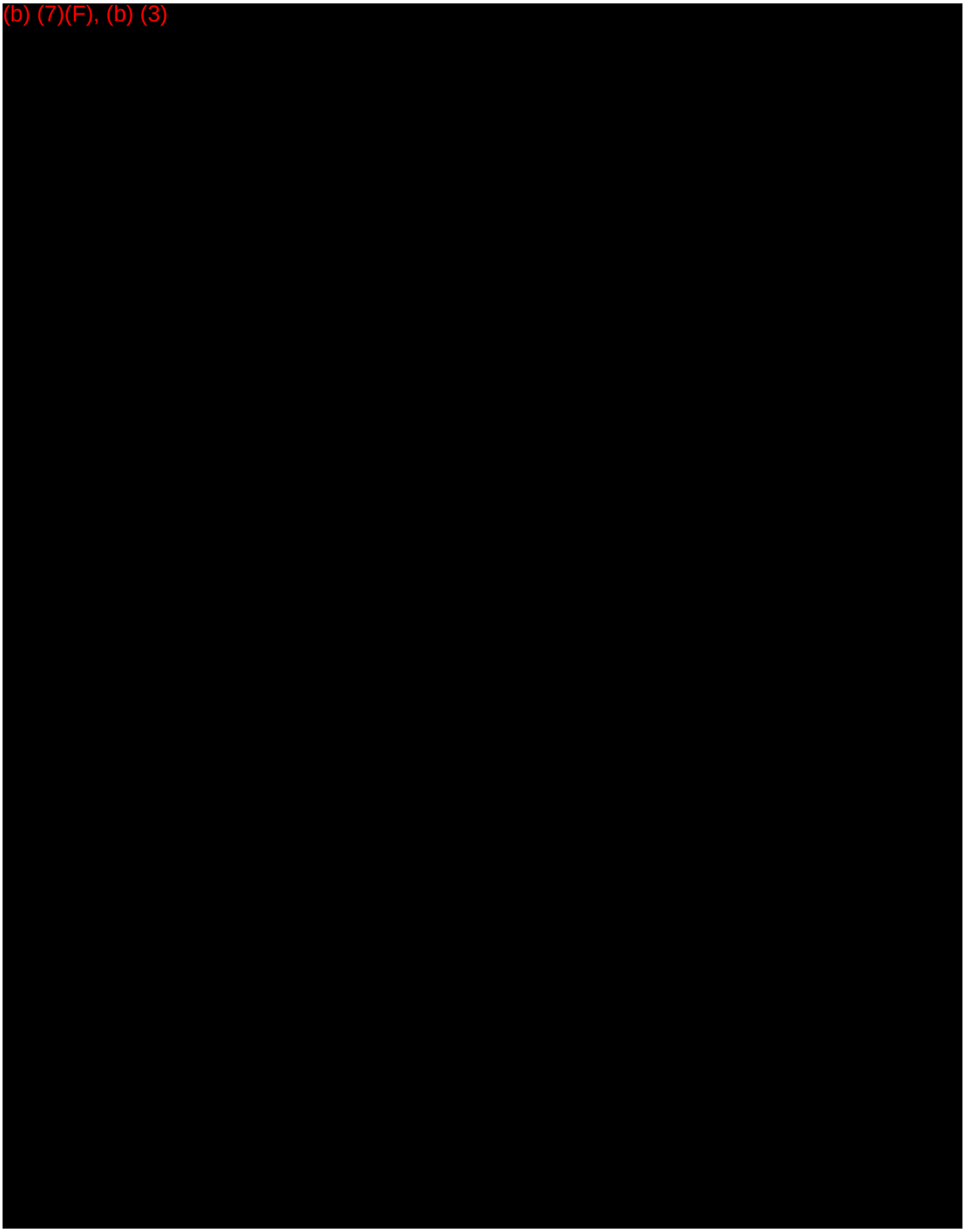


FIGURE 1-26 PROSPECT CREEK AIRPORT SITE PLAN

(b) (7)(F), (b) (3)

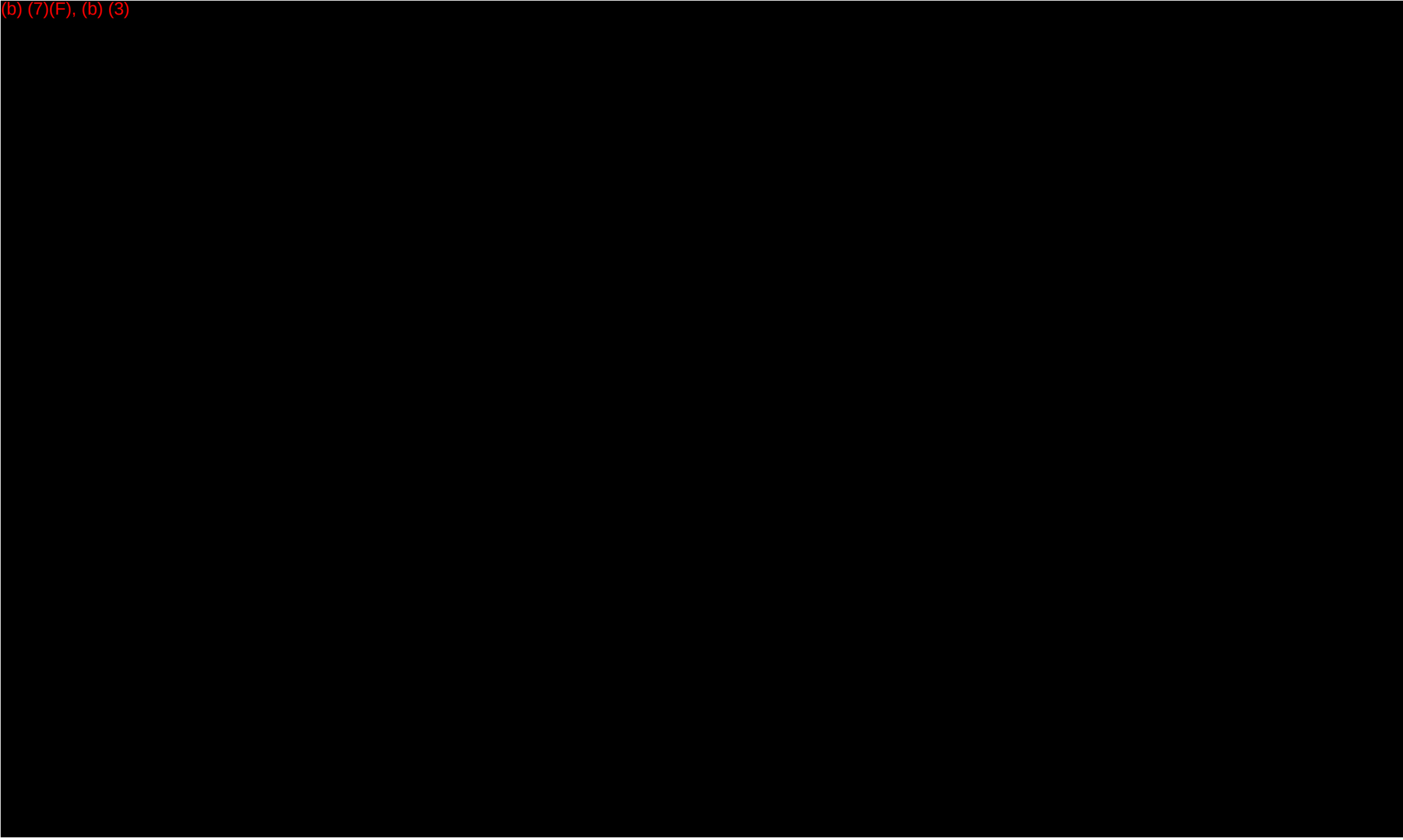


FIGURE 1-27 PUMP STATION 6 / YUKON RESPONSE BASE
SITE PLAN AND FACILITY DRAINAGE (OFFLINE FACILITY – OIL SPILL RESPONSE AND ROW MAINTENANCE ONLY)

(b) (7)(F), (b) (3)

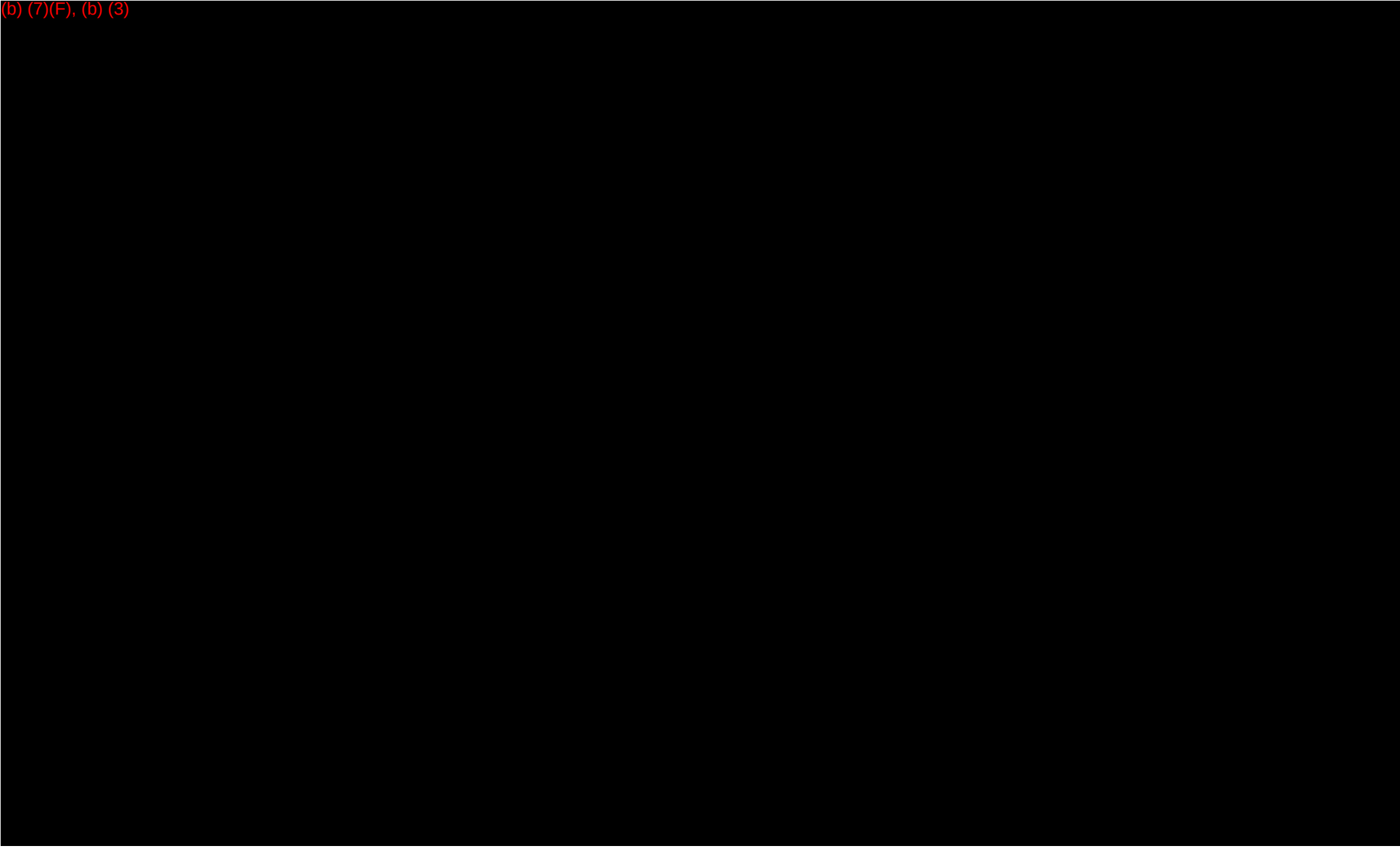


FIGURE 1-28 PUMP STATION 7 SITE PLAN AND FACILITY DRAINAGE

(b) (7)(F), (b) (3)

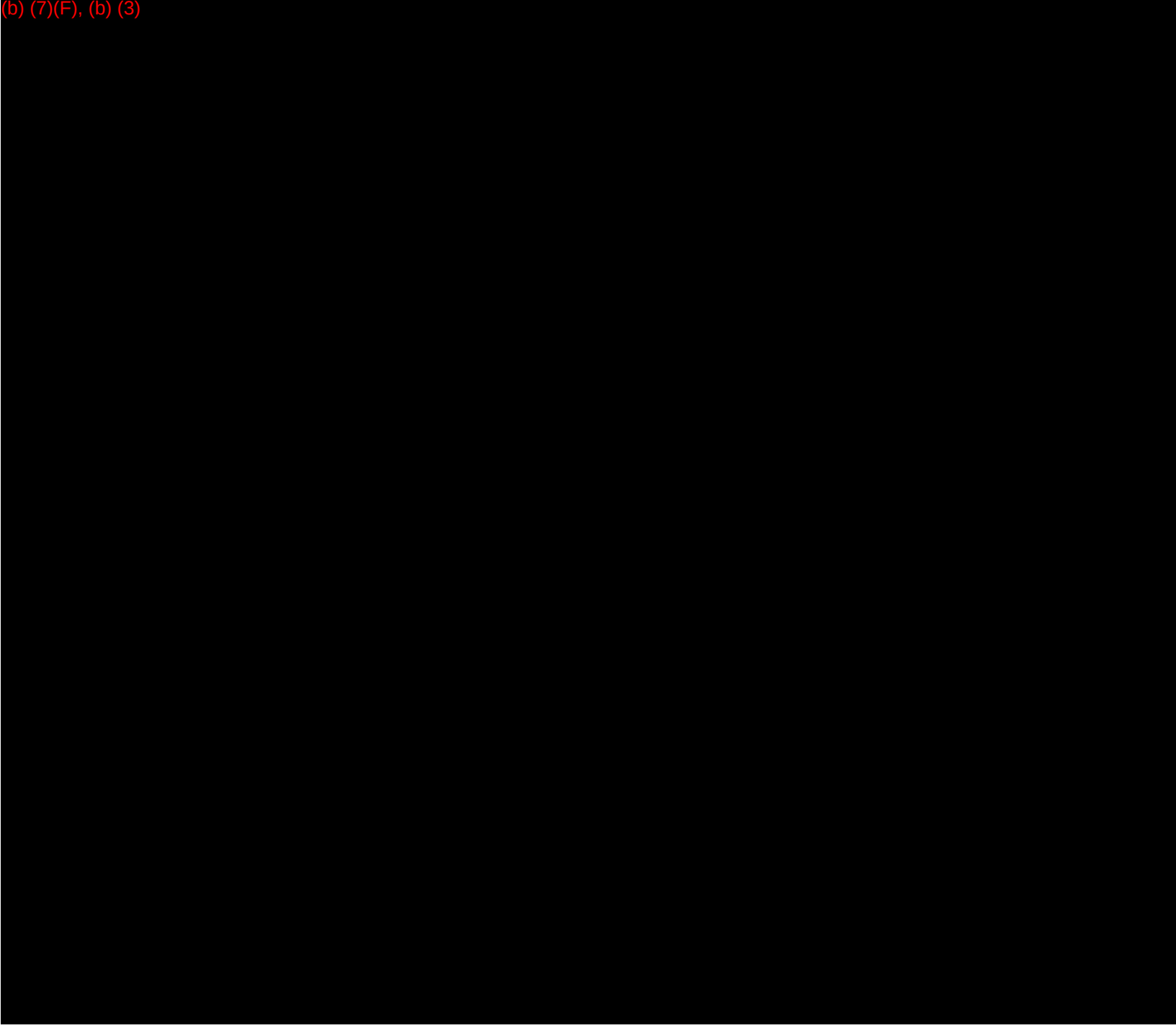


FIGURE 1-29 PUMP STATION 8 SITE PLAN AND FACILITY DRAINAGE (OFFLINE FACILITY)

(b) (7)(F), (b) (3)

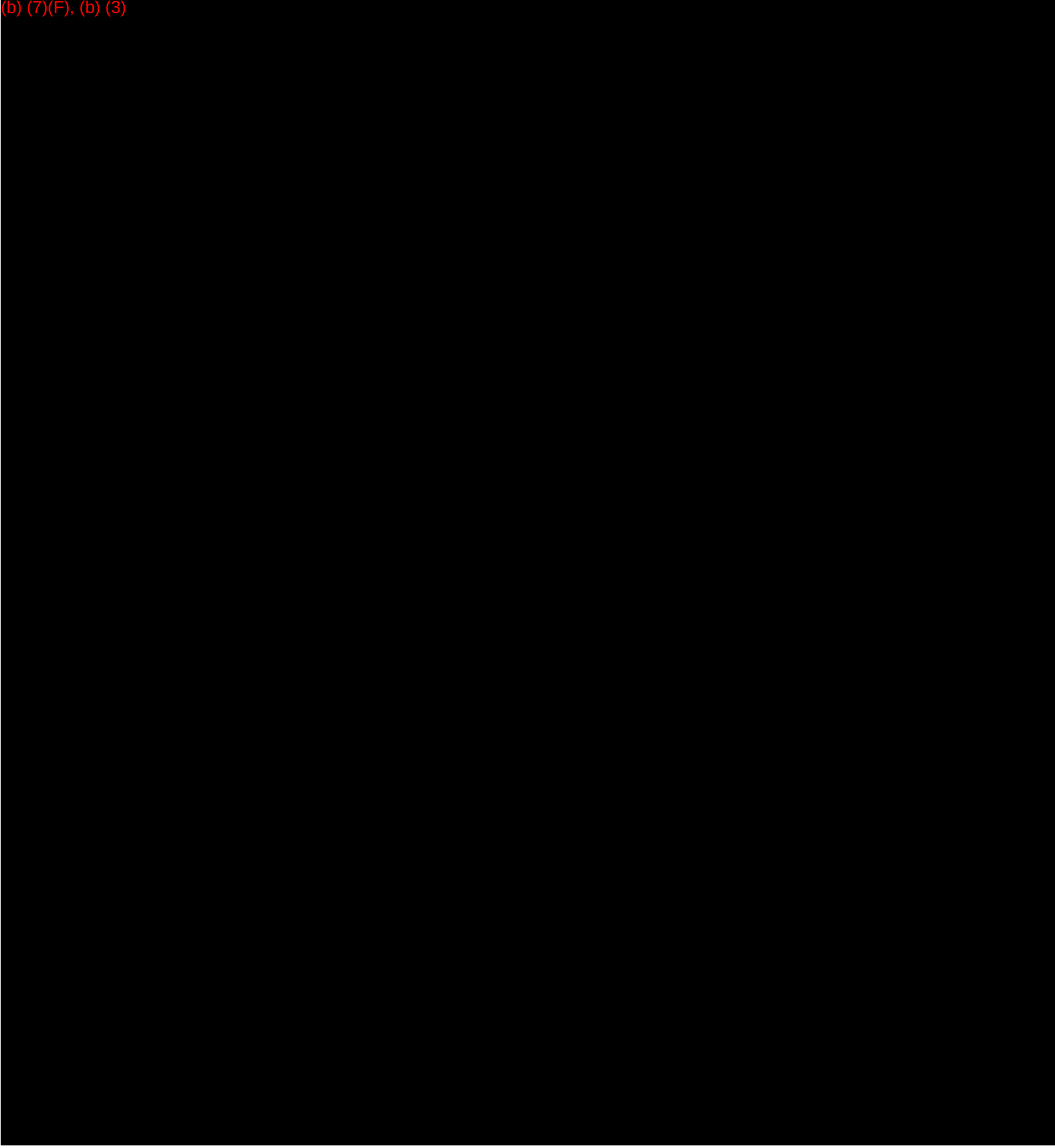


FIGURE 1-30 PUMP STATION 9 / DELTA RESPONSE BASE SITE PLAN AND FACILITY DRAINAGE

(b) (7)(F), (b) (3)

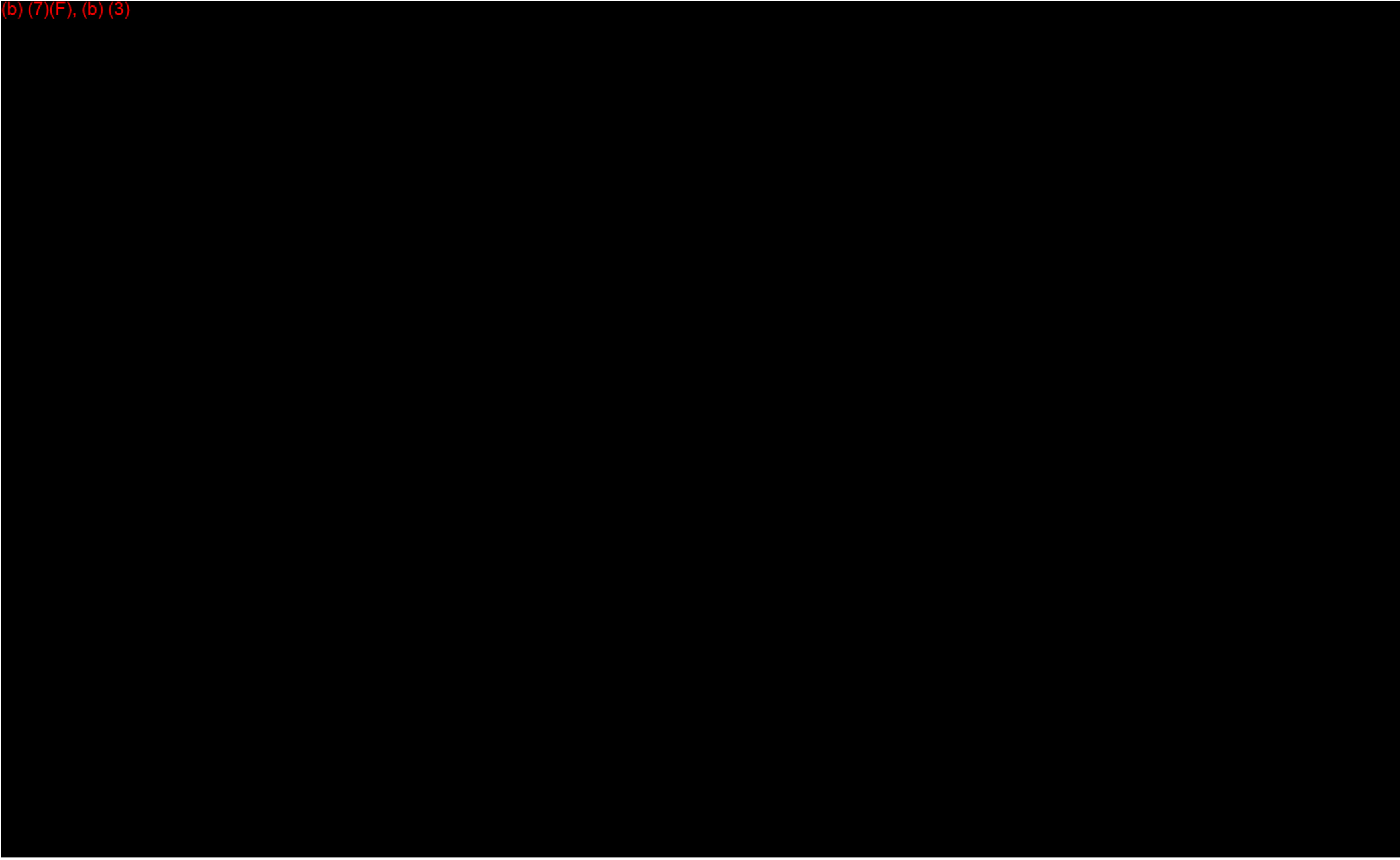


FIGURE 1-31 PUMP STATION 10 SITE PLAN AND FACILITY DRAINAGE (OFFLINE FACILITY)

(b) (7)(F), (b) (3)

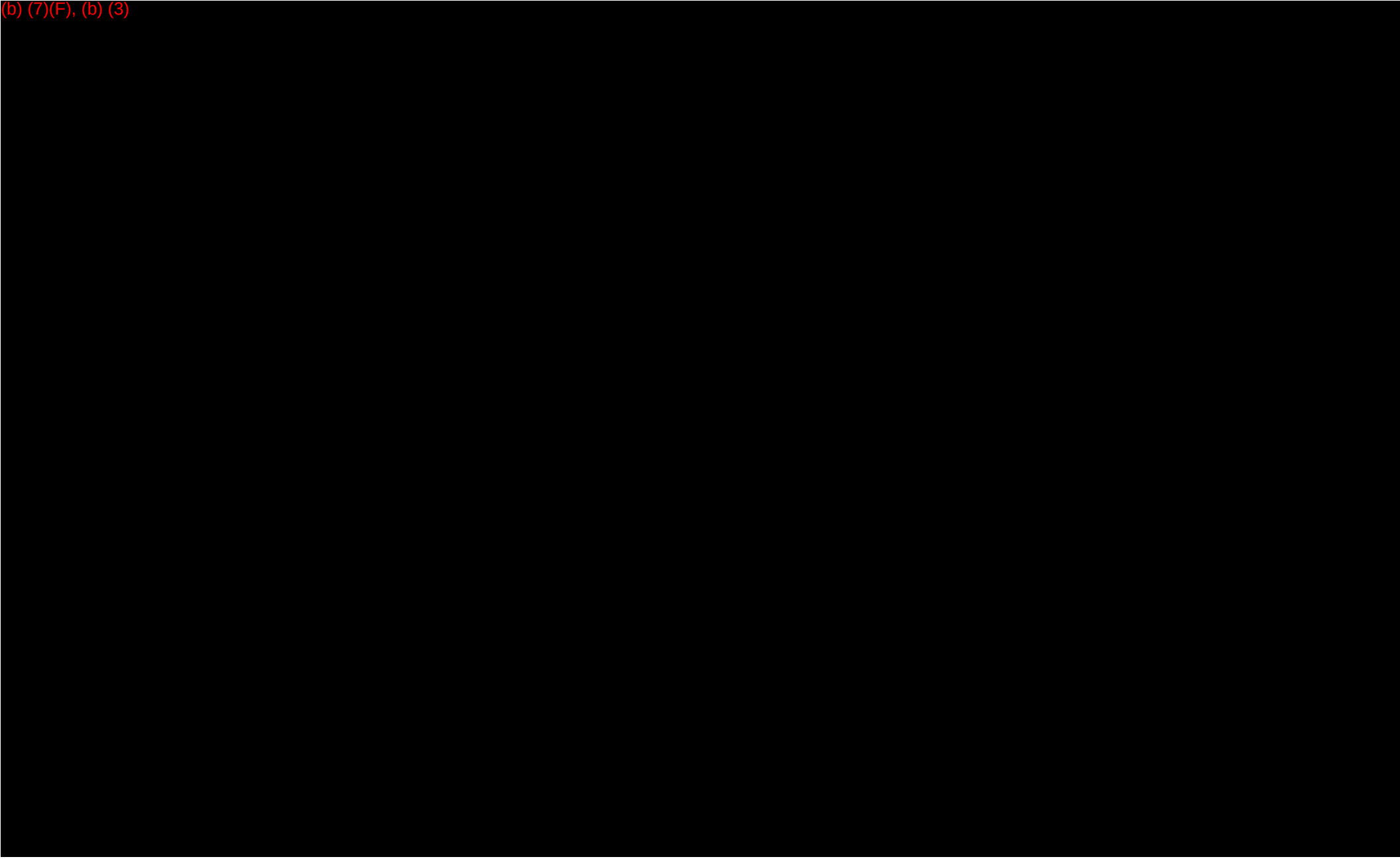


FIGURE 1-32 GLENNALLEN RESPONSE BASE SITE PLAN AND FACILITY DRAINAGE

(b) (7)(F), (b) (3)

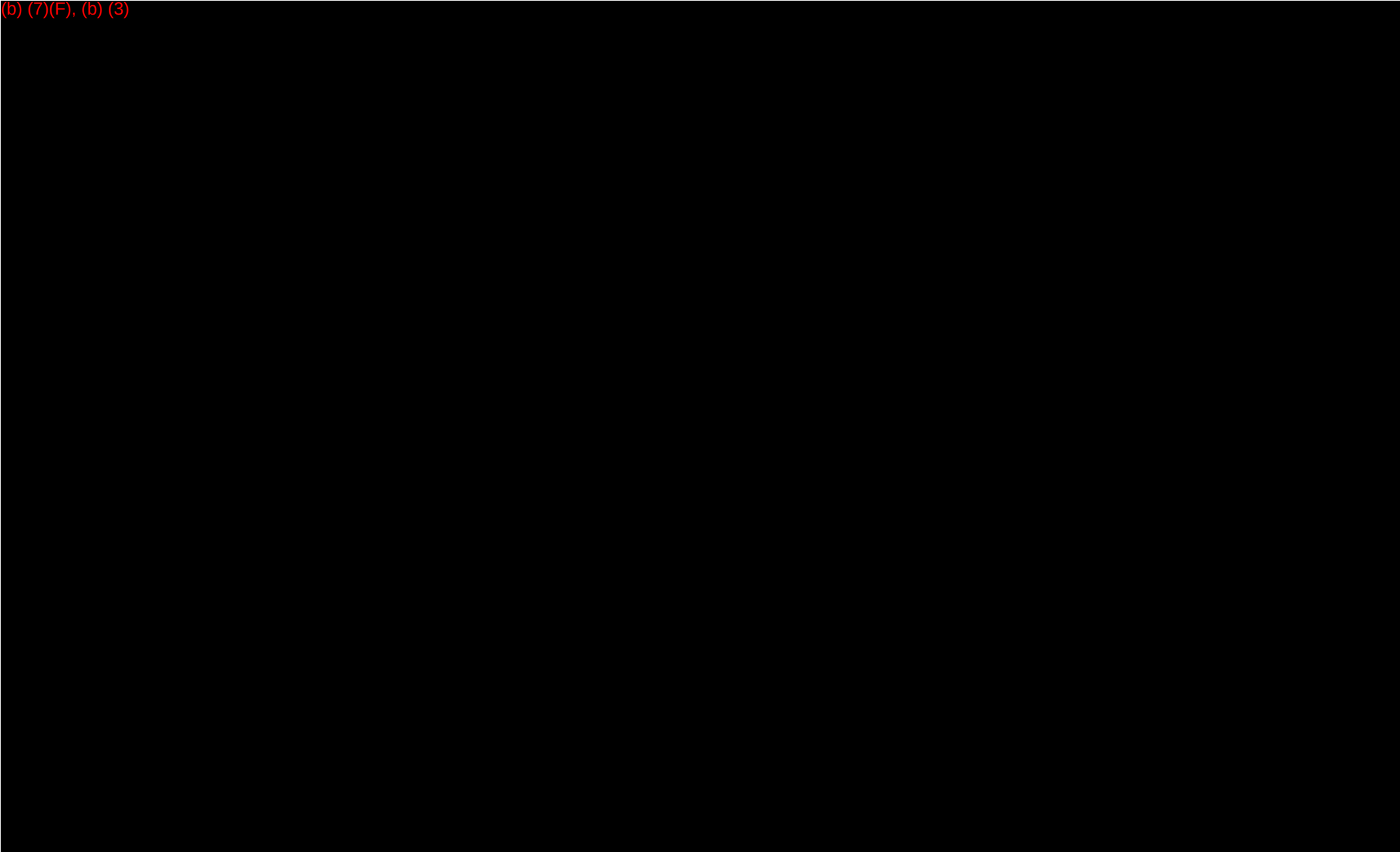


FIGURE 1-33 PUMP STATION 12 SITE PLAN AND FACILITY DRAINAGE (OFFLINE FACILITY)

1.8.3 Metering Stations

There are two metering stations along the Trans Alaska Pipeline System. One is located near North Pole, Alaska, at (b) (7)(F), . This metering station measures crude oil taken from and residual oil returned to TAPS from Petro Star and Flint Hills Alaska Petroleum refinery facilities. The metering station comprises meter skids, mainline pipeline take-off piping, isolation valves, and utility systems contained in metal sandwich panel buildings (Figures 1-35 and 1-36). The metering facility perimeter is fenced and occupied by a measurement technician during daytime hours only. The gate to the facility is locked when no one is on site.

The other metering station is called the Petro Star Metering Station and it is located at 2.5 mile Dayville Road (Valdez, Alaska) a (b) (7)(F), . This metering facility also measures crude oil from and residual oil returned to TAPS by the Petro Star Valdez Refinery. No oil storage tanks are associated with this facility (Figure 1-34).

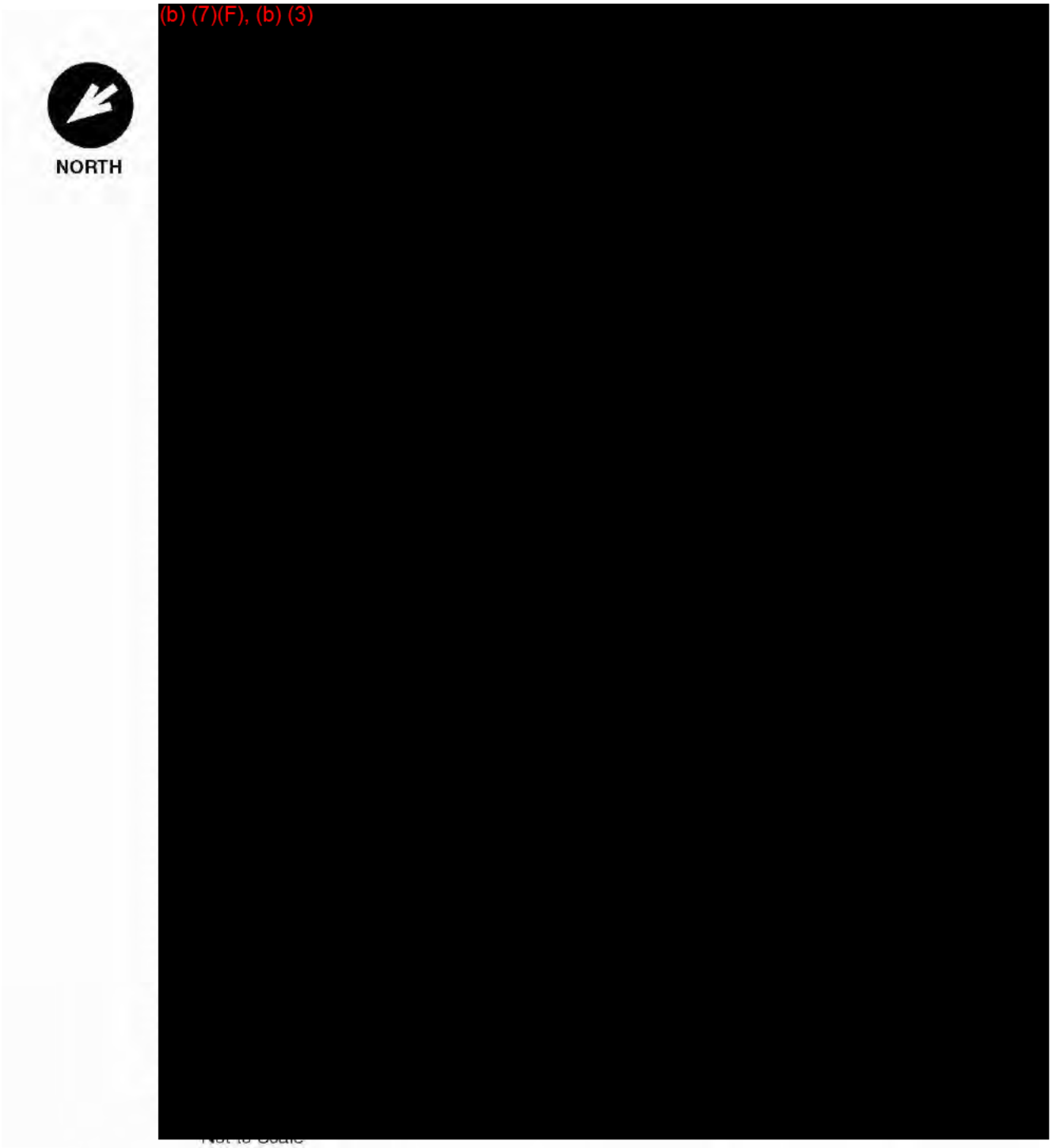


FIGURE 1-34 SITE PLAN OF NORTH POLE METERING STATION FROM THE EC-71-08 PLAN

(b) (7)(F), (b) (3)



FIGURE 1-35 NORTH POLE METERING FACILITY PIPING DIAGRAM

(b) (7)(F), (b) (3)

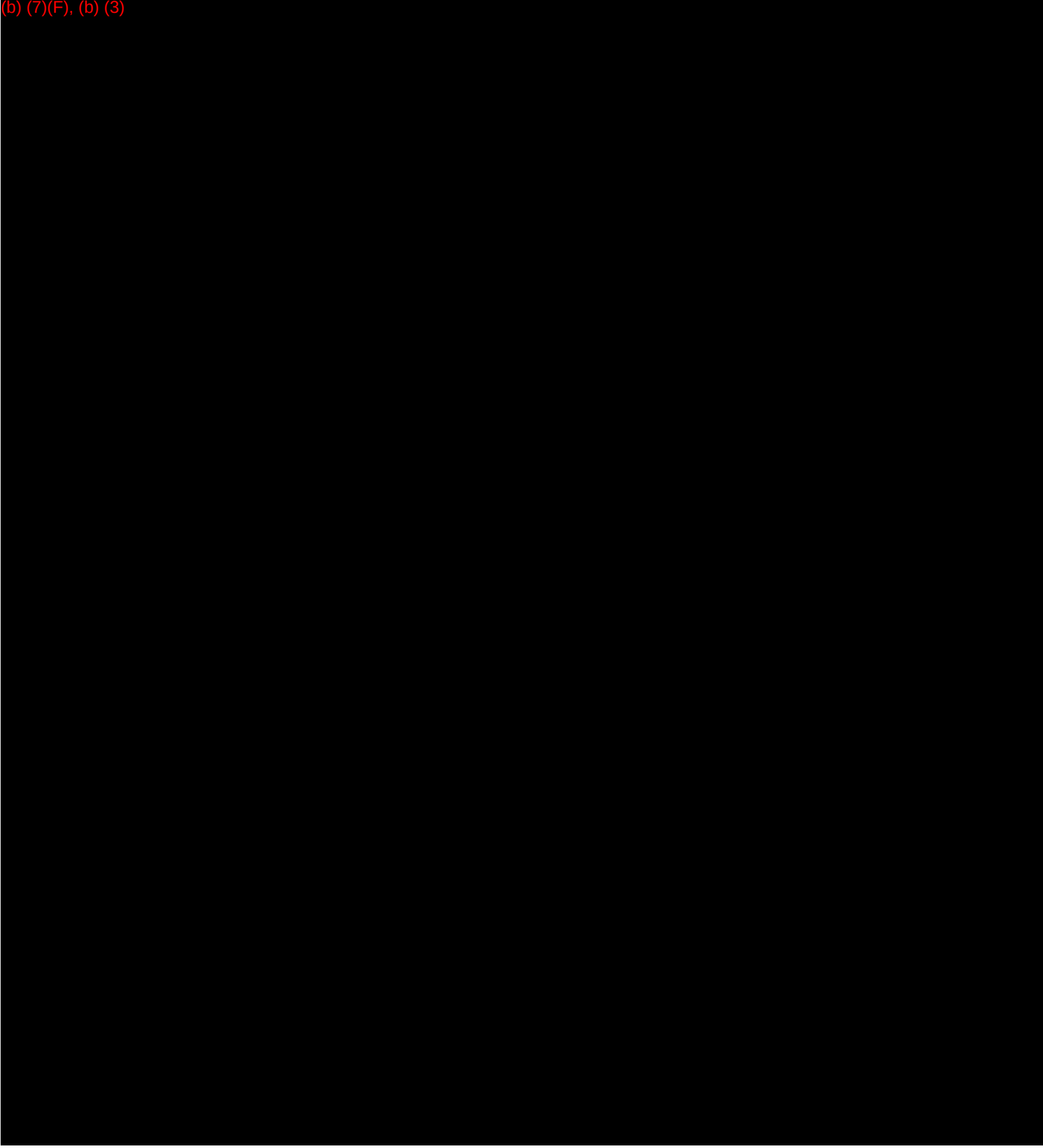


FIGURE 1-36 PETRO STAR METERING FACILITY SCHEMATIC

Section 2. Prevention Plan [18 AAC 75.425(e)(2)]

2.1 PREVENTION PROGRAMS IN PLACE [18 AAC 75.020 AND 18 AAC 75.425(e)(2)(i)]

Oil transportation and storage facilities associated with the pipeline system are designed and operated in a way to prevent and minimize oil spills. The equipment used to prevent oil release includes:

- Control system interlocks
- Redundant system design
- Secondary containment systems
- Level gauges
- Abnormal condition alarms
- Leak detection systems

Operational systems in place include:

- Safe operating procedures (SOPs)
- Operator training and qualification programs
- Corrosion monitoring and prevention programs
- Preventive maintenance programs
- Quality assurance program
- Inspector qualification program
- Loss prevention program
- Work permit system
- Surveillance program
- Earthquake monitoring program
- Substance abuse programs
- Medical monitoring programs
- Security programs
- Transfer procedures

The following discussion is not intended to be a comprehensive survey of all aspects of each program related to oil spill prevention practices but rather a summary of the spill prevention measures. This summary will include references to source documents which provide in-depth discussion of the programs.

2.1.1 Prevention and Operations Training Programs [18 AAC 75.020(a) and 18 AAC 75.425(e)(2)(i)]

Staffing on the pipeline is made up of technicians, maintenance, inspection, support services, and project personnel. Those having direct control or maintenance responsibilities over the oil handling or transportation portions of TAPS receive operations and oil spill prevention training through multiple mechanisms. Contract workers involved in routine or project maintenance activities on the pipeline receive oil spill prevention training to the degree necessary to perform their work. Contract maintenance and project work is controlled by a project work plan and work permit system.

Alyeska's training programs for operational activities involve qualification and certification standards, as well as licensing. All training programs are implemented by professional staff and/or contractors, documented by means of records and tests, and enforced by management.

Alyeska's operations and prevention training program includes classroom training, equipment familiarization, field exercises, and drills. Successful completion of certain operational type courses by students result in certification by federal, state, or professional organizations. Course curricula are periodically updated as a result of operational experience, technology advances, and changes in laws and jurisdictions.

A description of oil spill training is provided in Volume 1, Section 3.9, "Oil Spill Training and Exercise Programs."

2.1.1.1 Key Pipeline Positions [18 AAC 75.020(b)(1) and 18 AAC 75.020(b)(2)]

The following is a list of key pipeline positions, general job duties, and the qualifications and/or certifications to hold a particular job.

Maintenance Supervisor (MS)

- Reports directly to a Pipeline Area Manager.
- Requires a Bachelor's degree or equivalent and a minimum of seven years exempt level experience.
- Responsible for the management of one of the primary pipeline assets. This includes a pump station(s), right-of-way (ROW), and facilities on either side of it.
- Provides leadership and direct supervision for all area personnel.

RBS

- Reports directly to the ROW Director.
- Requires a Bachelor's degree or equivalent and a minimum of five years exempt level experience.
- Provides supervision and management of Technicians to maintain operational status of the pipeline, Right of Way, protect Alyeska's assets.
- Ensures contractor work performance, and completion of operations and maintenance projects.

- Performs all of the responsibilities of a P&CM.

P&CM

- Reports directly to the ROW Director.
- Requires a Bachelor's degree or equivalent and a minimum of five years exempt level experience.
- Responsible for combining the proprietary and oversight responsibilities for the ROW, including oil spill and contingency preparedness, for their area.

OC

- Reports directly to the ROW Director.
- Requires a Bachelor's degree or equivalent and a minimum of five years exempt level experience.
- Responsible with the P&CM and RBS for regional spill prevention and control.
- Knowledgeable in TAPS ODPCP, Incident Command System (ICS), oil fate and behavior on land and water, spill containment and recovery tactics and equipment including earth-moving equipment, leak detection systems, and communications.
- Reviews and verifies the accuracy of the contractor training records.
- Assists the contractors in fulfilling the training requirements.

Safety Officer (SO)

- Reports directly to the Fire, Safety & Industrial Hygiene Team Lead.
- Requires a bachelor's degree or equivalent training/experience in the safety or industrial hygiene field.

- Must be certified as a safety professional.
- Responsibilities include providing comprehensive and effective safety services and monitoring and assisting site contractors.
- Duties include:
  - Safety inspections
  - Contractor safety audits
  - Training
  - Process safety management review
  - Emergency response
  - Code and policy interpretation
  - Hazard/operability studies (HAZOPS)
  - Incident investigations

Environmental Coordinator (EC)

- Reports to the Environmental Manager.
- Requires a bachelor's degree and a minimum of four years exempt level experience.
- Responsible for working with field personnel on environmental issues, such as permits, hazardous waste, air, and water.
- Monitors air, water, and land permit compliance.
- Responds to regulator questions.

Technician

Technicians perform the actual operation and maintenance of pipeline facilities. There are two classifications of technicians:

- Operations
- Maintenance

Each group qualifies under a performance based training system called the Qualification Development Program (formerly known as the Tech Progression Program).

- **Operations Technician**
  - Reports directly to the MS
  - Requires a high school diploma or equivalent
  - Monitors and operates pump station equipment and control systems

- **Pipeline Maintenance Technician**

Maintenance technicians are further separated into three groups:

- Instrument
- Electrical
- Mechanical
- **Instrument Technician**
  - Reports directly to the Linewide Supervisor
  - Requires a high school diploma or equivalent
  - Calibrates, troubleshoots, and repairs all control, measurement, and instrumented equipment
- **Electrical Technician**
  - Reports directly to the Linewide Supervisor
  - Requires a high school diploma or equivalent
  - Maintains certification as applicable (state certificate of fitness)
  - Maintains all motor control centers, distribution panels, transmission lines, and electrical equipment to manufacturer's specifications and National Electrical Code (NEC) standards
  - Troubleshoots and corrects electrical failures
- **Mechanical Technician**
  - Reports directly to the Linewide Supervisor
  - Requires a high school diploma or equivalent
  - Maintains certification as applicable (Pressure Safety Vessel, Refrigeration)
  - Calibrates, troubleshoots, and repairs all mechanical equipment to maintain proper operating parameters

Baseline Crew

- Positioned at each response base and provided by the contractor(s)
- Consists of one equipment operator, one laborer, and one teamster (either a union Teamster or a non-union driver with a Class A CDL and Hazmat endorsement)
- Primary responsibility is oil spill(s) and contingency response(s)
- Responsible for all civil maintenance at the stations, on the ROW, access roads, and airports
- Supports building and ground maintenance and snow removal at the pump station

Baseline Mechanic

- Positioned at response bases and provided by the contractor(s)

- Responsible for maintenance and repair of motorized equipment, including equipment used for oil spill response

Oil Movements Specialist (Controller)

- Positioned at the Operations Control Center (OCC)
- Reports to OCC Operations and Maintenance Supervisor
- Accountable for safe, efficient, and reliable use of the pipeline, tankage, and pumping equipment
- Adheres to operating limits and directives associated with the system
- Contact point for verbal reports relating to normal, abnormal, or emergency operating conditions from personnel and the general public and ensures appropriate internal and external notifications

Inspection Personnel

- Reports to Inspection Supervisor
- Positioned linewide as required
- Maintains applicable certifications and qualifications per *AMS-031, Inspection and Testing Process.*
- Accountable for performing inspections or tests on TAPS assets per *AMS-031.*
- Meets the standards of:
  - API 653, Third Edition, December 2001, Addendum 1, September 2003
  - API 570, Second Edition, October 1998, Addendum 1, February 2000, Addendum 2, December 2001, and Addendum 3, August 2003

Fairbanks Extended Urban Team

- Positioned in the Fairbanks area, this team consists of urban-based staff trained as oil spill responders and recon personnel
- Acts as an additional pool of resources for the Fairbanks area and accountable to respond during drills, exercises, and events
- Tracked on the daily IRT forms for the Fairbanks Response Base

2.1.1.2 Summary of Key Training [18 AAC 75.020(b)(3)]

The qualification manuals, procedures, courses, certifications, and performance checklists listed in this section provide detailed training objectives, subjects, and schedules.

- Operator Qualification Program - *OQ-242, Operator Qualification Manual* – This manual establishes specific guidelines for assessing, evaluating, and qualifying Alyeska employees and TAPS contractors who perform Covered and Core tasks.
- *Design and maintenance of passive fire alarm systems* (courses CER/029 through CER/039) – Covers material in *13 AAC 50.027* and includes fire alarm signaling systems and related devices, fire sprinkler systems, standpipe systems, and special hazard systems. Successful students are

certified by the Alaska State Fire Marshall and issued a permit for this type of work. This training is primarily for instrument technicians.

- *CFC refrigerant transition and recovery* (courses CER/015, 017, and 019) – Covers techniques used for the recovery of CFCs during the transition to alternative refrigerants in high pressure, low pressure, and small appliances. Successful students are certified by the U.S. Environmental Protection Agency (EPA). This training is primarily for maintenance technicians (mechanical).
- *Corporate safety – Covers Alyeska's SA-38, Corporate Safety Manual.* All personnel receive this training.
- *Mainline valves (gate valves)* (course VAL/027) – Covers details of valve maintenance and repair. This training is primarily for maintenance technicians (instrument) and select others.
- *Preventive maintenance* (courses ADM/109 and ADM/111) – Familiarizes students with Alyeska's preventive maintenance program, including the Oracle EAM computer software. The program ensures that TAPS is well maintained and operates reliably. All technicians receive this training.
- *Control Room Operator* (courses PC-CRO/*xxx*) – Performance checks for operational procedures required of the Control Room Operator (CRO) for safe operation of the pipeline.
- Training of the operators at the pump stations and the Operations Control Center (OCC) is not limited to a traditional academic environment. Operator training occurs in three phases:
  - Initial classroom training
  - Field indoctrination
  - On-the-job training
- *Surveillance, monitoring, and erosion control* (MAM/013 and MAM/011) – Provides an overview of the techniques used to determine the physical condition of the pipeline and requirements for reporting deficiencies. This training is primarily for P&CMs and RBSs.
- *Spill prevention, control, and countermeasures (SPCC)* (course OSCP/02) – Covers measures used to prevent and control oil spills as described in facility SPCC Plans. All pump station personnel receive this training.
- *OM-1, Procedural Manual for Operations, Maintenance, and Emergencies* – Provides an overview of the regulations governing the transportation of hazardous liquids by pipeline as stated in *49 CFR 195*.
- *Inspection Personnel Training* – Inspection personnel are qualified and certified following the requirements in *AMS-031-01, Qualification and Certification of Inspection Personnel, and AMS-011, Training and Qualification Process. AMS-031-01* provides the requirements for each type of inspector and the requisite experience, qualification, and certification required to perform each type of inspection. Industry standards, related experience, and professional certification are used to ensure that personnel performing inspection on TAPS are qualified and certified to a consistent standard that meets the requirements of the Federal Grant and State Right of Way commitments. This process covers inspection personnel, including nondestructive testing technicians.

2.1.1.3 Other Training [18 AAC 75.020(b)(3)]

In addition to the routine operations training identified in Volume 1, Section 3.9, Alyeska regularly holds tailgate safety meetings, communication meetings, and requires individuals to be cognizant and proficient in the safe operating procedures (SOPs) specific to their job duties.

2.1.1.4 Maintenance of Training Records [18 AAC 75.020(c)(3)]

Training records for each Alyeska employee are available through a computerized database called eLITE. Access to eLITE is through the Alyeska A-Net.

All training is documented on Alyeska's "Training Roster" (Form 7047). The "Training Roster" requires each participant to print and sign their name and also requires the instructor's name and signature. It also includes the course code, course title, location, start time, start date, and duration of training.

Information from the "Training Roster" is entered into eLITE. eLITE credits individuals with courses taken and provides for a variety of reports that can be used to determine each employee's training status vis-a-vis the requirements. The computer records are all maintained for the term of employment for each employee. Team leaders are responsible for ensuring that each employee receives 100% of their required training.

All contractor training records required to meet OSCP requirements are reported to Alyeska on a quarterly basis and documented in eLITE. This includes direct training for the courses identified in the OSCP Training Matrix as well as equivalent training provided by the contractors. Alyeska is also required to provide ADEC with quarterly documentation that contractor response personnel are trained according to the schedule described in this Plan.

In addition, the regional oil spill response coordinators review and verify the accuracy of the contractor training records and assist the contractors in fulfilling the training requirements.

2.1.2 Substance Abuse Programs [18 AAC 75.007(e)(2) and 18 AAC 75.425(e)(2)(A)(ii)]

2.1.2.1 Drug Testing Program

Alyeska employees, and contractors who perform operations, maintenance, or emergency functions on oil handling or transfer facilities, or are operators of a commercial motor vehicle, are covered under a drug testing program designed to meet the requirements of:

- Department of Transportation (DOT) Pipeline Safety Standards in *49 CFR 199*
- Department of Transportation Federal Motor Carrier Standards in *49 CFR 383, 387*, and *390 - 399*

The program consists of urine analysis for the prohibited drugs of marijuana, cocaine, opiates, amphetamines, and phencyclidine (PCP) conducted by the U.S. Department of Health and Human Services (DHHS) National Institute of Drug Abuse (NIDA)-certified testing laboratories.

Covered employees (see below) are subject to pre-employment drug testing, random testing, reasonable-cause testing, post-accident testing, and return-to-duty testing and follow-up testing.

Covered Employees

The following positions (related to the pipeline) are covered under the drug testing program.

- Administrative Assistants (field assigned)
- Facility Engineer (field assigned)
- Fire Protection Specialist
- Oil Movements Specialist (Controller)
- MS (field assigned)
- SCADA Lead
- S/IH Specialist (field assigned)
- Technician (all levels, field assigned)
- P&CM
- Security Personnel

Frequency of Testing

- *Pre-employment testing* is done when a selected applicant is offered employment, when a current employee is moved to a covered position, and when a covered employee returns from a leave of absence of 90 days or more.
- *Random testing* is the unannounced testing of covered employees selected at random at a testing rate established by the DOT each year. Employees selected for testing are returned to the pool of those eligible for testing and are subject to re-selection during the 12-month period.
- *Reasonable-cause testing* will take place when there is a reasonable and articulated belief that an employee is using a prohibited drug.
- *Post-accident testing* will be conducted as soon as possible, but no later than 32 hours, after an accident. Alyeska will drug test each covered employee whose performance either contributed to the accident, as defined under regulations, or cannot be completely discounted as a contributing factor to the accident.
- *Return to duty and follow-up testing* will be required of employees in covered positions who return to duty after completion of drug rehabilitation and a verified negative test. Follow-up drug testing is scheduled for a period of not more than 60 months after returning to duty. Testing will be without prior notice and is in addition to the other types of testing.

For additional specific information as to the drug testing process, review, and record retention, contact the Alyeska Safety and Health Department.

Contractor Personnel

Alyeska requires its contractors (as part of the contractual obligation) to ensure that their employees meet the requirements of the previously noted DOT Pipeline Safety Standards and DOT Federal Motor Carrier Standards.

2.1.2.2 Alcohol Testing Program

Alyeska's current alcohol testing program is based on reasonable cause and post-accident administration of a breath analysis for alcohol. Reasonable cause determination by security personnel or supervision, based on a reasonable and articulated belief that an employee, or other person seeking access to an Alyeska facility, may be under the influence of alcohol, will initiate a breath analysis for alcohol test. If the confirmation test produces a result showing a blood alcohol level of 0.04% or higher, the person will be removed from the covered position and denied access to the facility. Supervision will be notified of the circumstances and test result.

On January 1, 1995, Alyeska instituted an alcohol testing program designed to meet the requirements of DOT Federal Motor Carrier's Standards and DOT Pipeline Safety Standards for all covered employees.

Frequency of Testing

- *Random testing* on an unannounced basis will be performed on employees in covered positions. Testing will be done monthly and will include 25% of covered employees each year.
- *Reasonable-cause testing* will take place when there is a reasonable and articulated belief that an employee is under the influence of alcohol.
- *Post-accident testing* will be conducted as soon as possible after an accident. Person(s) to be tested will be those whose performance either contributed to the accident as defined under regulation, or cannot be completely discounted as a contributing factor to an accident.
- *Abstention* from the consumption of alcohol for covered employees for four hours prior to reporting for duty will be required.

If through random testing or reasonable-cause testing, an employee registers a blood alcohol level of 0.02% to 0.039%, the employee will be relieved of duty until a retest registers below 0.02%, or the employee remains off duty for at least eight hours.

If an employee's confirmation test result is 0.04% blood alcohol or above, the employee will be relieved of duty and receive a mandatory referral to a substance abuse professional. Return to work will be based upon the judgment of the substance abuse professional and the successful completion of a substance abuse program. Follow-up testing, as determined by the substance abuse professional, will be implemented with a minimum of six tests done in the first 12 months.

For additional specific information as to the drug testing process, review, and record retention, contact the Alyeska Safety and Health Department.

2.1.3 Medical Monitoring Programs [18 AAC 75.007(e)(2) and 18 AAC 75.425(e)(2)(A)(ii)]

Alyeska maintains both a pre-placement and an annual mandatory medical monitoring program for employees assigned to operations and maintenance or emergency response positions at field locations. The purpose of the program is to reasonably ensure that employees are physically, medically, and mentally able to effectively perform the essential job functions to which they are assigned and where applicable, meet the requirements of OSHA and DOT.

The mandatory components of the physical exam are urinalysis, complete blood count, spirometry, audiogram, vision acuity, pulmonary function exam, physical exam/medical history, and blood work to include cholesterol and blood sugar level. Examination results will be reviewed by Alyeska's Medical Director or designee and discussed with the employee. A written opinion regarding the employee's ability to perform the assigned work will be placed in the employee medical file and discussed with appropriate management.

Additionally, employees are required to notify the Occupational Health Unit when absent from work due to injury or illness for more than five consecutive work days. The employee's supervisor is also responsible to make the same notification and to require a medical release (Form 0007) from the Occupational Health Unit prior to allowing the employee to return to work. A physician's release to return to work must be obtained for all disability absences such as any on-the-job injury with lost time, medivac, or serious illness including, but not limited to:

- Heart disease of all types
- All types of vascular disease (stroke, paralysis, fainting, convulsions, blackouts, unconsciousness, etc.)
- Psychiatric treatment
- Alcoholism or drug addiction
- Back complaints, injuries, surgery, or pain
- Operations, other than minor surgery
- Severe crippling diseases or the residual effects of injuries
- Eye problems
- Ear/hearing problems

For additional specific information regarding the medical monitoring program, contact the Alyeska Safety and Health Department.

2.1.4 Security Programs [18 AAC 75.007(f) and 18 AAC 75.425(e)(2)(A)(iii)]

(b) (7)(F), (b) (3)

[redacted]

(b) (7)(F), (b) (3)

[redacted]

2.1.5 Transfer Procedures [18 AAC 75.025]

Alyeska transfers a number of hydrocarbon products at various locations along the pipeline system. Safe operating procedures (SOPs) and operating procedures (OPs) have been developed to control this activity and ensure that proper precautions are taken to reduce the risk or size of a spill during transfer operations. Refer to pipeline operating or maintenance procedures. Access current documents from the TAPS Document System at http://www.alyeska-pipeline.com/tapsdocument.

- *6.4.15-05, Off-loading Fuel Into Stationary Aboveground Storage Tank (Less Than 10,000 gal. Capacity) at PS05*
- *6.4.15-MP238, Off-loading Fuel Into Stationary Aboveground Storage Tank (Less Than 10,000 gal. Capacity) at MP-238 DRA*
- *6.4.15-YRB, Unloading Fuel Into Stationary Aboveground Storage Tank (Less Than 10,000 gal. Capacity) at the Yukon Response Base*
- *6.4.15-07, Unloading Fuel Into Stationary Aboveground Storage Tank (Less Than 10,000 gal. Capacity) at PS07*
- *6.4.15-NPMS, Unloading Fuel Into Stationary Aboveground Storage Tank (Less Than 10,000 gal. Capacity) at NPMS*
- *6.4.15-09, Unloading Fuel Into Stationary Aboveground Storage Tanks (Less Than 10,000 gal. Capacity) at PS09*
- *6.4.15-10, Unloading Fuel Into Stationary Aboveground Storage Tank (Less Than 10,000 gal. Capacity) at PS10*
- *6.4.02-03, Unloading Fuel Into Stationary Aboveground Storage Tank (10,000 to 15,000 gal. Capacity) at PS03*

- *6.4.02-04, Unloading Fuel Into Stationary Aboveground Storage Tank (10,000 to 15,000 gal. Capacity) at PS04*
- *6.4.02-07, Unloading Fuel Into Stationary Aboveground Storage Tank (10,000 to 15,000 gal. Capacity) at PS07*
- *6.4.02-09, Unloading Fuel Into Stationary Aboveground Storage Tank (10,000 to 15,000 gal. Capacity) at PS09*
- *6.4.02-YRB, Unloading Fuel Into Stationary Aboveground Storage Tank (10,000 to 15,000 gal. Capacity) at the Yukon Response Base*
- *6.4.05-01, Unloading Turbine Fuel at PS01*
- *6.4.05-04, Unloading Process / Turbine Fuel at PS04*
- *6.4.05-05, Off Loading Turbine Fuel at PS05*
- *6.4.05-07, Offloading Turbine Fuel at PS07*
- *6.4.08-01, Loading the Spreader Truck with Turbine Fuel at PS01*
- *6.4.08-04, Loading the Spreader Truck with Ultra Low Sulfur Diesel (ULSD) Fuel at PS04*
- *6.4.08-05, Loading the Spreader Truck with Turbine Fuel at PS05*
- *6.4.08-07, Loading the Spreader Truck with Turbine Fuel at PS07*
- *6.4.10-04, Loading Fuel Spreader Truck from Service Pump at PS04*
- *6.4.10-05, Loading Fuel Spreader Truck from Service Pump at PS05*
- *MP-M40-001, Propane Tank Fill and Integrity Check - Mainline Valve Sites and Remote Engine/Generator Sites*
- *N-4.02.02, Fuel Handling and Qualification of Non-technicians in the Pipeline Asset Teams*

While the various SOPs and OPs differ in the specifics of location, type of product, and nature of transfer, the general format and content is as follows:

1. *Scope* - Describes in detail the subject of the SOP or OP and the coordination required with Alyeska functions.
2. *Preparation* - Contains items that must be checked or in place before transfer can begin. While differing from site to site most stress that:
    - The area must be cleared.
    - There can be no hot work in the area.
    - The truck must have its engine off (except for self-offloading tankers), brakes set, and wheels blocked.
    - Actions to be taken in case of fire
    - Driver's qualifications must be verified.

- Initial site-specific qualification of non-technician loader/off loaders (drivers) includes instruction provided by a pump station technician on the Safe or Operating Procedure for that location on the order, location, identification and operation of valves, switches, and control devices. The instruction also includes an explanation of the use of metering devices and documentation via the Master Meter Receipt. Requalification of the driver will occur within the month prior to the 12-month anniversary of the last qualification. Qualification records will be maintained at the pump station. A copy of the list of qualified drivers is kept at the security gate for verification, and the Control Room Operator will be notified if the driver's qualification is nearing expiration or has expired.
- Driver must be instructed to manually close the truck valves in an emergency and move the truck if possible.

3. *Materials, Tools, and Equipment* - Describes in detail the materials, tools, and equipment required to accomplish the transfer of a particular product at a particular location.
4. *Procedures* - Lists the detailed steps for each type of transfer at each location and, while they differ somewhat, most require that the following actions are accomplished.
    - Log in the driver.
    - Verify driver qualifications.
    - Determine/verify the type and amount of fuel to be transferred.
    - Verify tank gauge reading and adequate tank space available to receive transfer amount [18 AAC 75.065(k)(3)].
    - Give the driver a copy of the applicable SOP or OP.
    - Check the seals on the tanker.
    - Issue the driver an operations handheld radio.
    - Establish a ground connection.
    - Establish communication with the Control Room Operator.
    - Set drip pans under connection locations.
    - Inspect the tanker for leaks including a visual examination of the lowermost drain and all outlets before filling and before departure.
    - Inspect all required hose and fittings for integrity and cleanliness.
    - Connect hose(s).
    - Stop transfer orders.
    - Draindown and disconnect.
    - Blank flange or cap truck and transfer system valves before leaving transfer area.

The SOPs are summarized in Table 2-1. Table 2-1 also lists other Alyeska guidelines that are applicable to the *18 AAC 75* requirements.

Note: Any changes made to the SOPs related to fuel transfer must meet the requirements of 1*8 AAC 75.025* and Alyeska's requirement of *AMS-001*.

TABLE 2-1 TRANSFER PROCEDURES AND GUIDELINES PER 18 AAC 75

Manual and Identifying Numbers	Title	Applicable Locations	18 AAC 75 Criteria					
			A: Pretransfer Checklist	B: Hookup, Startup, Shutdown	C: Reduced Rates	D: Communications	E: Fastest Shutdown	Other
SIM-215-3.5 System 3.5, Tanks, Section 4	Tank Farm Surveillance	PS01, 03, 04, 05, 07, 09	Check tank valves and seals for leaks. Verify no leaks from water draw valves. Assure level indicators are operating properly. Verify dike drain valves closed and locked.	Not applicable	Not applicable	Not applicable		
N-4.02.02	Fuel Handling and Qualification of Nontechnicians in the Pipeline Asset Teams	All locations	See 4.02.02 C, "Qualification Requirements"	Each tanker driver is trained on the appropriate procedures for the location being addressed.	Not applicable	Each tanker driver is trained in the requirements for and use of handheld radios. The form "Preadmission Checklist" requires the driver to contact the Control Room immediately in the event of any spill or major discrepancy.	The form "Familiarization & Certification of Non-Technician Individuals" documents that each driver has received training in: 1) Offloading procedures 2) Fire Response 3) Emergency evacuation 4) Spill response and reporting 5) How to cease flow in an emergency	
EN-43-007	Environmental Protection Manual: Spill Prevention, Reporting, and Cleanup	All locations	Not applicable	Portable containment berms will be used whenever and wherever fluid transfer and fueling operations occur.	Not applicable	Not applicable		

TABLE 2-1 (CONTINUED) TRANSFER PROCEDURES AND GUIDELINES PER 18 AAC 75

Manual and Identifying Numbers	Title	Applicable Locations	18 AAC 75 Criteria					
			A: Pretransfer Checklist	B: Hookup, Startup, Shutdown	C: Reduced Rates	D: Communications	E: Fastest Shutdown	Other
MP-M40-001	Propane Tank Fill and Integrity Check – Mainline Valve Sites and Remote Engine/Generator Sites	PS04, 05, 08, 09, 10,	Obtain a work permit. Have a technician in attendance. Position the vehicle away from any equipment intake. Chock the vehicle wheels. Use available surveillance camera(s) to observe the process.	Inspect hose fittings, check tank levels, connect ground, connect hoses, set gas detector on ground downwind, open truck valves, start pump, check for leaks, monitor tank gauge, close truck valves, disconnect lines, fill to only 87%.				
6.4.08-05	Loading the Spreader Truck With Turbine Fuel at PS05	PS05	Among other things: area clear, no hot work in area, brake set, wheels chocked.	Connect ground, open hatches, set drip pan, connect hose, verify tanker ullage, align valve, set meter open valve, check for leaks, start pump, stop pump, close valves, disconnect hose and ground, ensure hose disengaged, check for leaks.		Technician in attendance.		
6.4.10-03, -04, -05	Loading Fuel Spreader Truck from Service Pump at PS03, 04, & 05	Pump Stations	Among other things: area clear, truck off, no hot work in area, establish load volume. Verify tank can hold quantity to be unloaded.	Connect grounding cable, determine quantity needed, start pump, check for leaks. Stop pump, remove standpipe. Close truck hatches. Verify lines are disengaged. Verify no leaks				
6.4.08-01	Loading Spreader Truck With Turbine Fuel at PS01	PS01	Among other things: verify quantity of fuel inTK-117. Verify spreader truck has space to handle desired quantity.	Connect ground, open hatches, set drip pan, arrange valves properly, set set-stop, open valve, open tanker valves, start pump, stop pump, set valves properly, clean up disconnect ground, ensure lines disengaged.		Technician in attendance.	Driver trained in communication procedures.	

Note: *This table includes those items that apply to 18 AAC 75 requirements. The procedures listed contain additional significant information. This table is for information and reference use only.*

2.1.6 Oil Tanks [18 AAC 75.065 and 18 AAC 75.066]

18 AAC 75.065 and *18 AAC 75.066* require an effective tank inspection program and a leak detection system for existing oil storage tanks. For crude oil breakout tanks at the pump stations, Alyeska's spill prevention program relies on a number of preventative maintenance measures that, when taken together, go beyond the minimum requirements of *18 AAC 75.065* and *18 AAC 75.066*. Alyeska's Tank Preventative Maintenance Program includes the following protective measures, described in more detail (b) (7)(F), (b) *, Tank Monitoring*.

- Tank bottom thickness inspection conducted as required by *API Std 653*
- Tank bottom structural repair in accordance with *API Std 653*
- Application of internal coating system in accordance with *API Std 652*
- Internal cathodic protection system
- External tank bottom cathodic protection system where appropriate for specific tank situations in accordance with *API RP 651*.
- Reinspection interval designed to prevent the occurrence of tank bottom penetration prior to the next scheduled inspection

Each regulated tank has undergone an initial inspection in accordance with *API Std 653* on the following schedule with tank age determined as of May 14, 1992:

- Tanks 10 to 19 years old: Completed by August 1, 1997
- Tanks less than 10 years old: In accordance with *API Std 653*

Subsequent internal and external inspections are performed in accordance with *API Standard 653.* These include routine, in-service, and periodic external inspections. Internal inspections are performed as required by *API 653* calculations. The tank procedure, (b) (7)(F), *0,* provides detailed information including a long-term schedule for tank inspections.

Accountability within Alyeska for compliance with regulations regarding oil storage tank inspections lies with Pipeline Operations and is functionally executed by the Engineering Department and the Inspection Department.

Compliance accountability includes notifying ADEC as soon as practical before a field-constructed aboveground oil storage tank undergoes major repair or alteration and before it is returned to service [18 AAC 75.065(e)(1) and (2)].

The majority of Alyeska's large crude oil and turbine fuel tanks were put into service in June of 1977. Crude oil and turbine fuel tanks at (b) (7)(F), (b) (3) were placed in service in 1983. A comprehensive listing of tanks by number can be found in . Summary information, including type of construction and the year the tank was put in service is contained in this plan in Table 2-2. All tanks are in good operating condition.

Tank inspection procedures meet or exceed the requirements of *API Std 653* as described in [redacted] A complete listing of oil storage tanks greater than 10,000 gallons on the pipeline are provided in Table 2-2.

Pursuant to 18 AAC 75.065(o), field-constructed aboveground oil storage tanks removed from service for more than one year will be:

- Free of accumulated oil,
- Marked “Out of Service” (and “Permanently Closed” per 40 CFR 112.2),
- Marked with the date taken out of service,
- Secured to prevent unauthorized use, and
- Blank flanged or otherwise disconnected from facility piping.

In addition, Alyeska will notify the department when a tank is removed from service and when the actions required above are complete.

2.1.6.1 Prevention of Tank Overfill

All crude oil breakout tanks and turbine fuel tanks are equipped with an ENRAF sensitive level gauging system for determining tank product levels. All of the ENRAF gauges can be read at the tank to determine product levels. In addition, all of the crude oil tanks have electronic readouts at both the local pump station control room and the Operations Control Center (OCC.) The turbine tanks at all pump stations have a remote level reading in the pump station control room.

High level alarms or automatic shut off devices are installed on all pump station crude oil break out tanks, turbine fuel tanks, diesel fuel tanks, and gasoline tanks. The design and use of the alarms meets the requirements of 18 AAC 75.065(k)(1) and 18 AAC 75.066(g)(1)(A). The design and use of the automatic shut off devices meets the requirements of 18 AAC 75.065(k)(2) and 18 AAC 75.066(g)(1)(B). All alarms and shut off devices can be periodically tested as required by 18 AAC 75.065(l) and 18 AAC 75.066(h).

Transfer procedures for bulk turbine fuel, diesel fuel, and gasoline are described in Volume 1, Section 2.1.5, “Transfer Procedures.” These transfer procedures incorporate the required overfill protection device pre-transfer testing and/or periodic inspection and testing of these devices.

Table 2-2 lists which tanks are protected from overfill by either alarms or automatic shut off devices.

2.1.6.2 Tank Inspection Procedures

The following procedures are in place for tank inspection.

1. All tanks are checked visually for signs of leakage at least weekly excluding (b) (7)(F), (b) (3) [redacted], weather conditions permitting.

2. On a monthly basis, the perimeter of each tank and the tank farm dike are visually checked for leaks, tank shell distortion or settlement, corrosion, foundation damage, insulation problems, or appurtenance problems.

3. Every 5 years, or as determined by *API Std 653* calculations, a comprehensive external inspection is conducted per *API Std 653* and signed by a certified *API Std 653* tank inspector.

4. Internal and external inspections are conducted as required by *API Std 653* calculations. The exceptions to this are the horizontal tanks, which have external access to the tank bottom for ultrasonic thickness test of the tank bottom rather than an internal inspection. Typical aboveground storage tank construction does not facilitate direct assessment of the tank bottom as they are directly on grade. When horizontal tanks are constructed in a manner in which the bottom inspection can be accomplished without entry, the tank bottom assessment will be conducted without entry.

5. Tanks TK-170 and TK-220 are included in Alyeska's tank inspection program in the event of cold restart, as necessary. These tanks were drained, cleaned, inspected, internally coated, and isolated from the system in 2010 and 2005, respectively. During a cold restart, one or both of these tanks would be reconnected to the system to allow re-circulation of oil through pumps (to increase the crude oil temperature) at the local facility. By agreement with the ADEC (Government Letter 26024), the periodic and external inspection frequency for these two tanks is:

    - A quarterly cold restart inspection for TK-220, and
    - A monthly cold start inspection for TK-170.

2.1.6.3 Leak Detection Monitoring [18 AAC 75.065(h)(1)(A) and 18 AAC 75.065(j)(4)(A)]

Weekly documented inspections are conducted by operations personnel at (b) (7)(F), (b) (3) [redacted] (Table 2-4). The surveillance includes checking for tank or piping damage, closed dike drains, water accumulations and for any signs of leakage.

Regulated turbine fuel tanks 117, 177, and 178 are also tested monthly for tank bottom leaks using a sensitive gauging system. The monthly tests will be conducted in accordance with the American Petroleum Institute (API) publication 323, "An Engineering Evaluation of Volumetric Methods of Leak Detection in Above Ground Storage Tanks," and publication 325, "An Evaluation of a Methodology for the Detection of Leaks in Aboveground Storage Tanks."

A system sensitivity level of 96 gallons over 48 hours has been established as the action level for these turbine fuel tanks. Similar to the protocol for daily fuel accounting, if the action level is exceeded, an investigation will be initiated to determine the cause of the discrepancy.

Tank 35-TK-157 was built during original construction, and it was removed from service in 2005. It was returned to service in 2013, which prompted leak detection requirements that fall under 18 AAC 75.065(j)(4)(A). Prior to return-to-service, Tank 157 is equipped with an under tank leak detection system designed in accordance with API Standard 650 Appendix I. The tank is retrofitted with five drain pipes that extend from the perimeter of the tank towards the center. Each drain pipe slopes slightly towards an external sump and monitoring riser, which can accommodate monthly monitoring from the exterior of the tank.

Crude oil breakout tanks with cathodic protection installed meet the regulatory requirements for leak detection via this system. These tanks are also part of the crude oil on-line leak detection system which is described in Volume 1, Section 2.1.8, "Piping Corrosion Control and Leak Detection Program."

Tank gauge sensitivities are different for the (b) (7)(F), (b) (3) Tank 117 turbine fuel tank and all other pump station (b) (7)(F), (b) turbine fuel tanks.

(b) (7)(F), (b) (3)

Other regulated fuel tanks shown in Table 2-2 are aboveground horizontal tanks or double wall tanks placed inside secondary containment. These tanks have accessible tank bottoms and are visually monitored for leaks.

The method of compliance, as allowed by *18 AAC 75.065 (h)(1)(A),* for leak detection for these tanks is use of a sensitive gauging system where visual inspection is not possible (vertical tanks) and visual inspection for double-wall or elevated horizontal tanks.

2.1.6.4 Cathodic Protection [18 AAC 75.065(h)(1)(B)]

Cathodic protection (CP) of Alyeska's oil storage tanks consists of internal sacrificial anodes, and in some cases, external impressed current CP systems. Tanks that are in "warm" service (i.e., crude oil breakout tanks) have been determined to be at higher risk to external tank bottom corrosion due to the temperature of the stored product or crude oil. These tanks have been retrofitted with external CP systems. All other oil storage tanks in "cold" service are provided adequate protection with internal sacrificial anodes.

Cathodic protection effectiveness and operation are maintained and monitored on a periodic basis by measuring structure-to-soil potentials and rectifier outputs [18 AAC 75.065(n) and 18 AAC 75.080(k)(3)]. Potential readings are taken at the tank perimeter on all tanks and on permanent reference cells installed under tanks when available. Monitoring efforts are conducted on the following intervals:

1. Bimonthly: Intervals not to exceed 21/2 months but at least six times per calendar year.
    - Rectifier outputs (DC volts/amps)
2. Annually: Intervals not to exceed 15 months but at least once per calendar year.
    - Structure-to-soil potentials
    - Rectifier output (DC volts/amps), efficiency, unit inspection
    - Anode outputs (amps) in junction boxes on ground beds

Annual cathodic protection system surveys demonstrate, via performance, that the tanks are protected in conformance with *API RP 651*.

TABLE 2-2 REGULATED STORAGE TANKS

Location	Description	Tank Identification	Tank Type	Foundation Type	Capacity (barrels)	Construction Standard	Last/Next External Inspection	Last/Next Internal Inspection	Overfill Technologies		Average Monthly Usage (barrels)	Comments
									Devices Installed	Existing Overfill Protection		
[redacted]	**ADEC-REGULATED ABOVEGROUND VERTICAL STORAGE TANKS >10,000 GALLONS (238 BARRELS)**											
	Turbine fuel	31-TK-117	Field constructed	Soil	[redacted]	API G/5th - Welded steel construction	2012/2017	2002/2022	Capacitance level switch with local alarm	External level switched alarm (j)(1) modified for testing	[redacted]	
	JP-4 fuel (out of service)	32-TK-3	Shop fabricated	Soil		Welded steel construction	NIS-2000	NIS-2000	Capacitance level switch with local alarm	External level switched alarm and shutoff (j)(1) with testing capability		Tank 32-TK-3 was put in service in 1977, moved to PS03 in 2001.
	Turbine fuel (out of service)	33-TK-137	Field constructed	Soil		API G/5th - Welded steel construction	NIS-2009	NIS-2009	NA	NA		
	Turbine fuel (out of service)	34-TK-147	Field constructed	Soil		API G/5th - Welded steel construction	2007/NIS-2010	2002/NIS-2010	NA	NA		
	Turbine fuel	35-TK-157	Field constructed	Soil		API G/5th - Welded steel construction	2011/2016	2011/2021	Capacitance level switch with local alarm	External level switched alarm(j)(1) modified for testing		35-TK-157 was removed from service in 2005 and returned to service in 2013 with an under tank leak detection system.
	Turbine	35-TK-3301R	Shop fabricated	Elevated		Welded steel construction	2011/2016	See Note 7	Visual, liquid	Transfer		
	Turbine	35-TK-3401R	Shop fabricated	Elevated		Welded steel construction	2011/2016	See Note 7	Level gauge	Monitoring		
	Turbine fuel (out of service)	36-TK-167	Field constructed	Soil		API G/5th - Welded steel construction (both)	NIS-2000	NIS-2000	NA	NA		
	Turbine fuel (out of service)	36-TK-168	Field constructed	Soil			NIS-2000	NIS-2000	NA	NA		
	Turbine fuel	37-TK-177	Field constructed	Soil		API D&G/6th - Welded steel construction (both)	2011/2016	1996/2016	Capacitance level switch with local alarm (both)	Level switched alarm (j)(1) modified for testing (both)		
	Turbine fuel	37-TK-178	Field constructed	Soil			2011/2016	1996/2016				
	Turbine fuel (out of service)	38-TK-187	Field constructed	Soil		API G/5th - Welded steel construction (both)	NIS-1998	NIS-1998	NA	NA		
	Turbine fuel (out of service)	38-TK-188	Field constructed	Soil			NIS-1998	NIS-1998	NA	NA		
	Turbine fuel (out of service)	39-TK-197	Field constructed	Soil		API G/5th - Welded steel construction (both)	2005/NIS-2008	1995/NIS-2008	NA	NA		
	Turbine fuel (out of service)	39-TK-198	Field constructed	Soil			2005/NIS-2008	1995/NIS-2008	NA	NA		

TABLE 2-2 (CONTINUED): REGULATED STORAGE TANKS

Location	Description	Tank Identification	Tank Type	Foundation Type	Capacity (barrels)	Construction Standard	Last/Next External Inspection	Last/Next Internal Inspection	Overfill Technologies		Average Monthly Usage (barrels)	Comments
									Devices Installed	Existing Overfill Protection		
(b) (7)(F), (b) (3)	Turbine fuel (out of service)	40-TK-207	Field constructed	Soil	(b) (7)(F), (b) (3)	API G/5th - Welded steel construction (both)	NIS-1998	NIS-1998	NA	NA	(b) (7)(F), (b) (3)	
	Turbine fuel (out of service)	40-TK-208	Field constructed	Soil			NIS-1998	NIS-1998	NA	NA		
	Turbine fuel (out of service)	42-TK-227	Field constructed	Soil		API G/5th - Welded steel construction (both)	1998/NIS-2005	1993/NIS-2005	NA	NA		
	Turbine fuel (out of service)	42-TK-228	Field constructed	Soil			1998/NIS2005	1993/NIS-2005	NA	NA		
						DOT CRUDE OIL BREAKOUT TANKS						
	Crude balancing tanks	31-TK-110	field-constructed	Modified ring wall		API 650 design, welded steel, cone roof (both)	2012/2017	2012/2032	Capacitance level switch with local and OCC alarms (both)	Level switched alarm (j)(1) modified for testing (both)		
		31-TK-111	Field constructed	Modified ring wall			2012/2017	2013/2023				
	Crude relief	33-TK-130	Field constructed	Soil		API 650 design, welded steel, cone roof	2011/2016	2001/2021	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		
	Crude relief	34-TK-140	Field constructed	Ring wall		API 650 design, welded steel, cone roof	2013/2018	2008/2028	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		
	Crude relief	35-TK-150	Field constructed	Soil		API 650 design, welded steel, cone roof	2010/2015	2005/2025	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		
	Crude relief (out of service)	36-TK-160	Field constructed	Soil		API 650 design, welded steel, cone roof	NIS-1998	NIS-1998	NA	NA		
	Crude relief (out of service)	37-TK-170	Field constructed	Soil		API 650 design, welded steel, cone roof	2006/Annual cold restart-2010	2010/2030	Level alarm switch and shut-off devices are removed, but level gauge will be available for reconnection in the event of a cold restart	NA		Tank to be retained for cold restart purposes.
	Crude relief (out of service)	38-TK-180	Field constructed	Soil		API 650 design, welded steel, cone roof	NIS-1998	NIS-1998	NA	NA		
	Crude relief	39-TK-190	Field constructed	Soil		API 650 design, welded steel, cone roof	2010/2015	2011/2021	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		

TABLE 2-2 (CONTINUED): REGULATED STORAGE TANKS

Location	Description	Tank Identification	Tank Type	Foundation Type	Capacity (barrels)	Construction Standard	Last/Next External Inspection	Last/Next Internal Inspection	Overfill Technologies		Average Monthly Usage (barrels)	Comments
									Devices Installed	Existing Overfill Protection		
(b) (7)(F), (b) (3)	Crude relief (out of service)	40-TK-200	Field constructed	Soil	(b) (7)(F), (b) (3)	API 650 design, welded steel, cone roof	NIS-1998	NIS-1998	NA	NA	(b) (7)(F), (b) (3)	
	Crude relief (out of service)	42-TK-220	Field constructed	Soil		API 650 design, welded steel, cone roof	2005/Annual cold restart-2005	2005/2025	Level alarm switch and shutoff devices are removed, but level gauge will be available for reconnection in the event of a cold restart	NA		Tank to be retained for cold restart purposes.
						MINOR TANKS – HORIZONTAL ABOVEGROUND						
	Diesel (MCCF)	10-TK-1100	Shop fabricated	Elevated		Welded steel construction	2011/2016	1996/NA	Capacitance level switch with local alarm	External level switched alarm (j)(1) with testing capability		This tank is waived from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated February 7, 2006, and Alyeska GL No. 7002.
	Diesel (Galbraith)	47-1-TK-3	Shop fabricated	Elevated		Welded steel construction	2011/2016	See Note 7	Capacitance level switch with local alarm	External level switched alarm (j)(1) with testing capability		This tank is waived from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated May 10, 2002, and Alyeska GL No. 02-18481.
	Diesel	36-TK-25	Field constructed	Elevated		Welded steel construction	2010/2015	2005/2025	Level alarm switch and shutoff	External level switched alarm and shutoff (j)(1) with testing capability		Tank 36-TK-25 is waived (with conditions) from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated August 7, 2000, and Alyeska GL No. 00-15691.
	Diesel	37-TK-28	Shop fabricated	Elevated		Welded steel construction	2011/2016	1996/2016	Level alarm switch and shutoff	External level switched alarm (j)(1) with testing capability		
	Diesel	39-TK-2	Field constructed	Elevated		Welded steel construction	2011/2016	1996/NA	Level alarm switch and shutoff	External level switched alarm (j)(1) with testing capability		Tank 39-TK-2 is waived (with conditions) from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated August 7, 2000, and Alyeska GL No. 00-15691.
	Diesel (out of service)	42-TK-25	Shop fabricated	Elevated		Welded steel construction	2006/NIS	1996/NIS	NA	NA		
	Diesel (out of service)	42-TK-26	Shop fabricated	Elevated		Welded steel construction	2006/NIS	1996/NIS	NA	NA		

Notes:

1. *Tanks below 10,000 gallons in volume are not listed in this table.*
2. *All tanks are of welded steel construction and all in service tanks are in good operating condition.*
3. *All tanks except TK-170, TK-177 and TK-178 were constructed between 1974 and 1976 and put in service in 1977.*
4. *Tank 37-TK-170 was installed between 1981 and 1983 and commissioned in 1983.*
5. *Tanks 177 and 178 were constructed in 1980 and put in service in 1983.*
6. *NIS = Not in Service.*
7. *Internal inspections are conducted as required by API Std 653 calculations. The exceptions to this are the horizontal tanks, which have external access to the tank bottom for ultrasonic thickness test of the tank bottom rather than an internal inspection. See Section 2.1.6.2.*

2.1.7 Description of Secondary Containment Areas [18 AAC 75.075]

2.1.7.1 Secondary Containment Areas for Storage Tanks

Pursuant to *18 AAC 75.075(a),* aboveground oil storage tanks are located within secondary containment with the capacity to hold the volume of the largest tank within the containment area, plus additional capacity to allow for local precipitation. Secondary containment also meets the requirements of this regulation by being adequately resistant to damage by the stored products, resistant to weather damage, sufficiently impermeable, and resistant to operational damage.

Alyeska performed compliance inspections for pump station secondary containment areas in 1992 and 2000. A summary of the evaluation of existing secondary containment systems under the requirements of *18 AAC 75.075,* entitled Project M6856, "Evaluate Secondary Containment Areas" (3/93), and "Final Report, Field Investigation and Evaluation for Pump Station Tank Farm Liners, October, 2000" was submitted to the Joint Pipeline Office (JPO).

Most secondary containment areas at Alyeska facilities were constructed in 1975 to 1977 to meet the requirements of *40 CFR 112.7*, "Guidelines for the Prevention and Implementation of a Spill Prevention Control and Countermeasures Plan." Pump station secondary containment areas were either lined with chlorinated polyethylene (CPE) or placed on natural materials deemed sufficiently impervious through analysis and inspection. Since original construction, new tankage has been added to meet operational requirements. All tankage greater than 10,000 gallons is within secondary containment. Table 2-3 provides secondary containment information for oil tanks.

In-place buried synthetic membrane liners are a (b) (7)(F), (b) (3) . Various areas were excavated and inspected in 1992. No in-service defects were found with the exception of some joint openings at liner penetration ducts.

(b) (7)(F), (b) (3) , the natural soil materials under the containment area and silt within the dike walls form the "impervious" barrier to infiltration. A (b) (7)(F) , the secondary containment basin consists of a natural lakebed with a layer of silt on the surface to a depth of 8 feet. The shallow permafrost within the silt layer further inhibits potential infiltration of oil into the subsurface layer of frozen gravel. At (b) (7) , the basin bottom consists of natural highly weathered schisty bedrock, silt, and silty sand. Dike walls have a high silt content. A series of infiltration tests were conducted within the diked areas at (b) (7)(F), The permeability, with respect to oil as a fluid medium, was estimated to be on the order of 10 cm/sec, which meets the criteria of "sufficiently impermeable."

Project work in 1998 provided new information related to the condition of tank farm secondary containment systems at (b) (7)(F), (b) (3)

- (b) (7) secondary containment system liner in the area of tank 140 was not installed per the original construction specification. The non-specification condition is a general lack of bedding material to protect the liner from rock abrasion or punctures. This system liner was replaced in 2000.
- PS05 liner boot penetrations in some locations had immediately adjacent areas showing either a disbonded or poorly adhered liner seam. This was discovered at the end of June 1998 during the project work. Further careful excavation to uncover the seams without disturbing them showed

- seams laying flat with no sign of infiltration, although the bonding or adhesion of some was weak. All of the seams in these areas were repaired/resealed up to the limits of the excavations for the project. An additional excavation of 200 lf was done in “Area 6,” referenced in the initial 1992 inspection. This resulted in a resealing of 50" of seam that was disbonded or poorly adhered.

In 2012, Project F821 constructed an earthen berm north of 39-TK-198 in the tank farm a (b) (7)(F) and replaced the original secondary containment liner in the revised containment area.

Alyeska maintains secondary containment areas free of debris, vegetation, and accumulated rainwater. However, snow in secondary containment is not routinely removed for the following reasons:

- Snow removal equipment could damage the secondary containment liner.
- Snow may be utilized effectively as a sorbent.

The operation of the valves draining secondary containment areas is strictly controlled by a permit system. Accumulated rainwater in pump station secondary containment areas is subject to visual examination and possible testing before dewatering. Regular dewatering is conducted to maintain secondary containment areas free of excessive rainwater.

Pursuant to 18 AAC 75.075(c), documented weekly inspections are conducted of the tank farm secondary containment areas at (b) (7)(F), (b) (3) Table 2-4).

Alyeska’s policy for cleanup of spills occurring inside secondary containment is to:

- Conduct immediate and continuous cleanup operations to accomplish the removal of gross surface contamination.
- Clean up of spills within tank farms or other lined containment areas including removal of contaminated soils to the bottom of the spill zone within 90 days of the event, or in the case of a winter spill, within 90 days of break-up.
- Where complete removal of the soils is not possible, commence in-situ remediation of the soils within 90 days.

2.1.7.2 Determination of Sufficiently Impermeable

During the summer of 2000 the tank farm secondary containment systems a (b) (7)(F), (b) (3) were assessed in order to determine whether they were sufficiently impermeable as required by the Alaska Department of Environmental Conservation regulations. The secondary containment systems at (b) (7)(F), (b) (3) had received sufficiently impermeable determinations in 1999 based on modification work (b) (7)(F) (b) and wholesale system replacemen (b) (7)(F), (b) (3) are not currently operating and were not analyzed.

The assessment conducted in 2000 included a qualitative examination of project records, a field investigation that included excavating select test pits to confirm the liner’s conditions, an evaluation of the observed liner damage, and repairs of damaged locations. Based on the results of the assessments, repairs, and system replacements, all secondary containment systems at all active pump stations meet the ADEC’s requirement of “sufficiently impermeable” for existing systems.

2.1.7.3 Secondary Containment Areas for Tank Truck Offloading Areas

Tank truck offloading areas at each pump station (active) are situated within secondary containment areas constructed with curbing or berms, and lined with an impermeable engineered fabric liner system resistant to deterioration from spilled product. The arrangement of the system is such that the tank truck valves and connection manifold is located in the center of the secondary containment and will contain a discharge of product.

The volumetric capacity of the secondary containment is provided in Table 2-5.

Fuel is delivered and off-loaded from conventional highway tankers with a total maximum capacity of (b) (7) gallons. The fuel tankers all have segmented compartments with a maximum single compartment capacity of (b) (7) gallons, typically segmented as follows:

Three-compartment tankers:

(b) (7)(F), (b) (3)

in the front compartment

in the middle (belly) compartment

in the tail compartment

Tank truck offloading areas with secondary containment waivers are listed in Table 2-6.

Tank truck offloading area secondary containment systems are fitted with drain systems for periodic use in draining snow melt and rainwater from the system. Alyeska maintains these secondary containment systems free of debris or other materials or conditions that may interfere with the effectiveness of the system. However, snow in secondary containment is not routinely removed for the following reasons:

- Snow removal equipment could damage the secondary containment liner.
- Snow may be utilized effectively as a sorbent.

The operation of drain valves in secondary containment is strictly controlled by a permit system. Accumulated water is subject to visual examination and possible testing prior to discharge. Drain valves are kept secured in the closed position unless water drainage is taking place.

Warning signs to prevent premature vehicular movement are present. Also, all Operating Procedures related to fuel unloading require that truck brakes are set, wheels are chocked, and the driver is out of the cab prior to offloading. Refer to Volume 1, Section 2.1.5, “Transfer Procedures.”

TABLE 2-3 DIKE CONTAINMENT INFORMATION

Tank				Containment Dike				
Location	Tank No.	Contents	Capacity (barrels)	Capacity (barrels)	Capacity[1] (percent)	Liner Bottom	Material Top[2]	Notes
(b) (7)(F), (b) (3)	31-TK-110 31-TK-111 31-TK-117	Crude Crude Turbine		(b) (7)(F), (b) (3)		B, C	A, B, C	Dike was modified in 1999 with the construction of a berm on east and north side. D ke is comprised of silt core and engineered liner material keyed to frozen silt layer under secondary containment area floor.
	10-TK-1100	Diesel				A	A	
	33-TK-130 33-TK-137	Crude Turbine				A	A	Tank 137 is empty and out of service/isolated.
	34-TK-140 34-TK-147	Crude Turbine				A	A	Tank 147 is empty and out of service/isolated.
	35-TK-150 35-TK-157 35-TK-3301R 35-TK-3401R	Crude Turbine Turbine Turbine				A	A	Reinforced chlorinated polyethylene
	36-TK-160 36-TK-167 36-TK-168	Crude Turbine Turbine				A	A	Tankage has been isolated, drained, and cleaned out. No longer in service.
	36-TK-25	Diesel				A	A	
	37-TK-170 37-TK-177 37-TK-178	Crude Turbine Turbine				A A	A A	Reinforced chlorinated polyethylene
	37-TK-28	Diesel				A	A	
	38-TK-180 38-TK-187 38-TK-188	Crude Turbine Turbine				D, C	C	Tankage has been isolated, drained, and cleaned out. No longer in service.
	39-TK-190 39-TK-197 39-TK-198 39-TK-2	Crude Turbine Turbine Diesel				A	A	Polyurea/Nonwoven goetextile. Dike was modified in 2012 with the construction of a berm between tanks 197 and 198. The berm excludes TK 198 from the dike. Tanks 197 and 198 are isolated, drained, and cleaned out. No longer in service.

TABLE 2-3 (CONTINUED) DIKE CONTAINMENT INFORMATION

Tank				Containment Dike				
Location	Tank No.	Contents	Capacity (barrels)	Capacity (barrels)	Capacity[1] (percent)	Liner Bottom	Material Top[2]	Notes
(b) (7)(F), (b) (3)	40-TK-200 40-TK-207 40-TK-208	Crude Turbine Turbine	(b) (7)(F), (b) (3)			A	A	Tankage has been isolated, drained, and cleaned out. No longer in service.
		Gasoline Diesel JP-4				A	A	Tankage has been isolated, drained, and cleaned out. No longer in service.
		Naphtha				A	A	Tankage has been isolated, drained, and cleaned out. No longer in service.
	42-TK-220 42-TK-227 42-TK-228	Crude Turbine Turbine				A	A	Tank 220 has been isolated, drained, and cleaned. No longer in service. This tank containment will be inspected annually. Tanks 227 and 228 are out of service.
	42-TK-25 42-TK-26	Diesel Diesel				A	A	Tank has been isolated, drained, and cleaned out. No longer in service.
	49-TK-1 49-TK-2	Diesel Diesel				A	A	Out of service

Notes:

1. *Capacity is in percent of largest single tank in the diked area.*
2. *A – Geomembrane*
   B – Permafrost
   C – Silt
   D – Bedrock
3. *Turbine tanks* (b) (7) *in secondary containment that is separate from the crude oil tank.*
4. *Turbine tank 39-TK-198 (out of service) is outside the tank farm dike.*

TABLE 2-4 LEAK DETECTION MONITORING, TANK INSPECTIONS, AND SECONDARY CONTAINMENT INSPECTIONS

Inspection Tasks	PS01	PS03	PS04	PS05	YRB	PS07	PS09	PS12
CP-35-1, Volume 1, Sections 2.1.6.2, 2.1.6.3, and 2.1.7.1 Tank Inspection Procedures and Leak Detection Monitoring								
Visually for signs of leakage, tank and piping damage, closed dike drains, water accumulations	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	Quarterly
QI Inspection including overfill devices. Tank perimeter and tank farm dike visually for leaks, tank shell distortion or settlement, corrosion, foundation damage, insulation or appurtenance problems.	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Quarterly
Turbine fuel tank bottom for leaks visually or by sensitive gauging system or under tank leak detection.	Monthly TK-117	NA	NA	Monthly TK-157	NA	Monthly TK-177 TK-178	NA	NA
CP-35-1, Volume 1, Section 2.1.7.1 Secondary Containment for Storage Tanks								
Inspection of Crude Oil Tank Farm secondary containment	Weekly	Weekly	Weekly	Weekly	NA	Weekly	Weekly	Weekly
Inspection of other secondary containment as noted	Weekly Turbine Tank Farm	NA	Weekly Airport JP-4 and Diesel	Airport JP-4	Weekly OSCP Bldg Fuel Supply Diesel, JP-4, and Gasoline Tank Farm	Weekly Diesel	Weekly Diesel	NA
CP-35-1, Volume 1, Section 2.1.8.4 Pump Station Leak Detection								
Station and tank farms looking for leaks in piping and valves.	Weekly	Weekly	Weekly	Weekly	Weekly	NA	Weekly	Monthly

TABLE 2-5 DESCRIPTION OF TANK TRUCK OFFLOADING SECONDARY CONTAINMENT AREAS

Location	Volumetric Capacity (gallons)	Liner Material
(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Geomembrane
		Geomembrane
		Geomembrane
		Geomembrane
		Decommissioned
		Geomembrane
		Decommissioned
		Geomembrane
		Decommissioned
		Geomembrane

TABLE 2-6 TANK TRUCK OFFLOADING AREAS WITH SECONDARY CONTAINMENT WAIVERS

Location	Area	Frequency
(b) (7)(F), (b) (3)	Diesel Fuel Containment Galbraith Lake Airport for Office Heating (47-1-TK-3)	Not to exceed 5 fillings per year
	MCCF Camp fuel tank (10-TK-1100)	One filling per year
	OSCP Building fuel tank (36-TK-25)	One filling per year
	OSCP Building fuel tank (39-TK-2)	One filling per year

Note:
See Section 2.6.1 for additional information.

2.1.8 Piping Corrosion Control and Leak Detection Program

18 AAC 75.080(b) requires that metallic facility piping containing oil be maintained in accordance with a corrosion control program.

Alyeska submitted a corrosion control plan for facility piping on December 9, 1993 (Alyeska letter APSC 9301802-G). Current corrosion control and leak detection programs are described in detail in a number of Alyeska documents. The type and level of corrosion control depends on the environment in which piping is placed, for example:

- Whether piping is abovegrade or belowgrade
- Type and condition of coating
- Type and effectiveness of cathodic protection systems
- Groundwater/soil environment in which piping is buried
- Type and flow characteristics of product transported in piping

The following sections outline the types of corrosion control used on TAPS mainline and facility piping and provide cross references to detailed documentation of methods employed.

2.1.8.1 TAPS Mainline

Corrosion control of facility piping containing oil on the TAPS mainline is conducted in accordance with DOT regulations (*49 CFR 195*) and described by Alyeska's design, monitoring, and maintenance procedures.

Design standards for corrosion control are defined by *DB-180, Design Basis Manual*, Section 1.7, "Corrosion Control." Standards in this document are in compliance with *49 CFR 195* and were approved as part of the Federal and State Right-of-Way Grant and Lease. They were used as the basis for the original pipeline system design. New facilities are subject to these same design standards.

Corrosion monitoring procedures are described in (b) (7)(F) (b)-series, Integrity Management Monitoring Program Procedures.

- Cathodic protection rectifiers are monitored in accordance with (b) (7)(F), (b), *Bimonthly Inspection – Rectifiers and Other Devices*.
- Mainline cathodic protection systems are monitored in accordance with (b) (7)(F), (b) *Pipeline Cathodic Protection System.*
- Cathodic protection monitoring data is interpreted in accordance with (b) (7)(F), (b) *Pipeline Cathodic Protection System*.
- Corrosion in-line inspection (smart pigging) is done in accordance with (b) (7)(F), (b) *Pipeline Integrity Pigging.*
- Cased road crossings are inspected in accordance with (b) (7)(F), (b) *Cathodic Protection System.*
- Corrosion integrity inspections are conducted by (b) (7)(F), (b) *Facility Corrosion Integrity Monitoring*, and associated Alyeska master specifications.
- Facilities' cathodic protection systems are monitored in accordance with (b) *Facilities Cathodic Protection Systems*.
- Girth-weld corrosion data is maintained in accordance with (b) (7)(F), (b) *Pipeline Integrity Pigging*.

Corrosion maintenance procedures are described in several Alyeska documents.

- Cathodic protection system maintenance is covered in Alyeska master specifications.
- Corrosion integrity maintenance is covered in *MR-48,* sections 2, 9, and 18, and in Alyeska master specifications.
- Any replacement piping will meet the requirements of *18 AAC 75.080(d).*

2.1.8.2 Corrosion Control Program for Buried Facility Piping

Alyeska's belowground facility piping is primarily concentrated at the 12 pump stations, the North Pole and Petro Star Metering facilities and some aircraft refueling locations.

Facility pipe corrosion control is an integral component of the Alyeska system integrity program defined in (b) (7)(F), (b), *Integrity Management Programs Process.* The pipe portion focuses on pipe integrity by inspections, use of cathodic protection, corrosion coupons and corrosion inhibitors for above and below ground piping and are administered by procedures supporting the overarching Integrity Management Program. Facility piping is organized or segmented into unique operating environments or line segments (legs) in accordance with the codified version of API Std 570, "Piping Inspection Code – Inspection, Repair, Alteration and Rerating of In-Service Piping Systems." Annual reports are created that provide a historical record of significant work completed each year along with recommendations for future monitoring and maintenance activities.

Corrosion control for facility piping is described in (*Facility Corrosion Integrity Monitoring,* and complies with *49 CFR 195, Subpart H, 18 AAC 75.080,* and *ASME B31.4.*

Alyeska's corrosion control approach encompasses more than controlling the detrimental electro-chemical activity (commonly known as "rusting") of buried pipe surfaces. Techniques include disconnecting and removing unnecessary pipes from service, replacing buried pipes with new ones, replacing pipe coatings on existing lines, inspecting and monitoring buried pipes to ensure pipe integrity and therefore greatly reduce risk of corrosion leakage, containing piping in leakage controlled areas, and adding cathodic protection systems. The cathodic protection systems essentially add or impress a low voltage DC electric current to belowground pipes to nullify or preclude the above-mentioned electro-chemical activity.

Many facility upgrades have been completed since original pipeline construction to reduce or mitigate adverse corrosion as part of Alyeska's corrosion control program. The warm crude oil flowing through the facilities keeps buried pipe surfaces warm, which increases potential corrosion activity. All of the active belowground crude oil piping at the northern permafrost stations (b) (7)(F), (b) (3) have been recoated and installed in insulated box systems providing cathodic protection. Cathodic protection systems have been upgraded at other locations and significant amounts of buried piping have been removed from service at both active and inactive stations. All of the buried crude oil piping is monitored on a bi-monthly and annual basis in accordance with DOT regulations (*49 CFR 195*). Subtle differences exist in the comparison of corrosion control requirements between *49 CFR 195* and *18 AAC 75.080*, but the corrosion control intent remains the same.

The non-DOT (*49 CFR 195*) facility oil piping systems are maintained in accordance with corrosion control program requirements outlined in *18 AAC 75.080*. The non-DOT oil lines essentially include liquid fuel piping systems: turbine fuel, diesel, gasoline, and JP-4 fuel. Liquid fuel is used for vehicle fuel as well as for heating the (b) (7) Annex and the (b) (7) LQ. The liquid fuel lines are typically "cold" or operate at ambient temperatures that create a much less corrosive pipe surface environment than experienced with warm crude oil lines. Fuel lines are also quite small in comparison to the crude oil system piping and hold much smaller volumes.

The TAPS Corrosion Control Program consists of periodic monitoring and engineered corrosion mitigating activities. Periodic program monitoring activities are outlined in the *MP-166* series procedures.

Elements of the TAPS Corrosion Control Program

There are five main elements to Alyeska's Corrosion Control Program for belowground facility piping:

1. TAPS oil piping will be maintained in accordance with regulatory requirements and an approved corrosion control program.

   Records of CP surveys and corrosion inspections are listed and filed in accordance with (b) (7)(F) (b) -series procedures and *CW-200, Records Retention Schedule*.

2. All belowground oil piping is included in a corrosion survey *[18 AAC 75.080(k)(2)]*.

   The scope of Alyeska's inspection and corrosion control program includes all belowground oil piping. Corrosion surveys are performed periodically and typically include cathodic protection monitoring and/or an engineered program of sample inspections for internal and external corrosion performed by nondestructive methods. External corrosion monitoring of belowground *49 CFR Part 195, ANSI B31.4* piping systems is included in procedures (b) (7)(F), (b) through (b) (7)(F), (b). External corrosion monitoring of non-DOT oil lines is accomplished by a combination of(b) *3*, *Facility Corrosion Integrity Monitoring,* and(b)

3. All belowground oil piping is carefully examined for deterioration anytime a section of buried line is exposed *[18 AAC 75.080(g)(1)* and *(g)(2)]*.

   Instructions for inspection reporting are included in Alyeska Specification *B-511*, *Pump Station and Terminal Pipe Investigation Specification*, and also outlined in *MR-48, Trans-Alaska Pipeline Maintenance and Repair Manual*, sections 2.6.1.3, 9.7.1.3, and 17.4.2. Inspection reporting is typically provided on Form 3619 "Pipe Investigation Report."

4. If corrosion is found when piping is exposed and examined, the pipe segment will receive an additional examination and corrective action will be taken to repair the damaged pipe. Action will be taken to control future corrosion as needed *[18 AAC 75.080(e)(1), (2)(A),* and *(B)]*.

   Additional inspections and re-inspections of corrosion damaged pipe segments are scheduled and performed depending upon the severity of corrosion found. Corrosion damaged piping not meeting code requirements will be repaired and will undergo an additional inspection within the current inspection year or inspection cycle. Line segments with lesser amounts of corrosion shall be inspected or re-inspected during the regularly scheduled inspection program. All cumulative corrosion data is reviewed and analyzed in aggregate to determine optimum inspection locations and scheduling. When a line segment requires repair to a corrosion damaged area, engineering action must be taken to evaluate the overall line segment for appropriate corrosion control improvements. Corrosion control improvements must be recommended and implemented as soon as practical.

5. When significant piping repairs or replacements are made, piping must be protected from corrosion by protective wrapping or coating and cathodic protection appropriate for local soil conditions, and be of all welded construction with no clamped, threaded, or similar connections for lines larger than one inch nominal pipe size *[18 AAC 75.080(l)]*.

New installations, repairs, and modifications to existing facilities are performed in accordance with *18 AAC 75.080(g)(2), AMS-004, Engineering Process,* which references design standards outlined in *DB-180, Design Basis Update,* Section 1.7, “Corrosion Control.” Corrosion control practice in design includes materials selection, protective wrapping or coatings, corrosion inhibitors, and cathodic protection systems where appropriate.

Alyeska Specification *P-503, Piping Material Line Class Specification*, Section 1.14, requires socket weld construction for all piping, except for special cases. Socket welding of all new construction precludes clamped, threaded, or similar connections for all buried piping.

Aboveground Piping Damage Protection [18 AAC 75.080(n)(2)]

Protection of mainline piping, pump station piping, and other pipeline facility oil piping is protected from physical impact damage by the following:

- Mainline piping in aboveground areas is protected by guard rail systems at highway overpasses, concrete blocks or bollards at buried highway crossings, or setbacks of sufficient distance to avoid highway vehicle impacts. Buried river crossings are identified by signs indicating a buried pipeline. Pipeline right-of-way access is strictly controlled to prevent general public vehicle travel along the right-of-way. To prevent vehicles with insufficient height clearance from impacting the aboveground pipeline, horizontal beams called “headache bars” have been placed over the access road in front of aboveground pipeline crossings.
- Pump station and other pipeline facility piping in areas of vehicle traffic is protected by guard rails, bollards, concrete blocks, or pipe strike portals for overhead piping. Additionally, warning signs are placed at the main gate and in areas of aboveground piping. Facility speed limits are restricted to 10 miles per hour.

Piping Supports

Facility piping supports meet the design standards defined in *DB-180, Design Basis Update,* Section 4.4, “Station Piping,” *ASME B31.3-2004,* Paragraph 321, and are designed to be seismically stable and composed of materials to minimize corrosion and prevent chafing *[18 AAC 75.080(i)]*.

2.1.8.3 Pipeline Leak Detection [18 AAC 75.055]

Alyeska has an established network of monitoring systems and devices to detect leaks, or the potential for leaks, on the pipeline. This network relies on two basic means of leak detection:

- Visual observations
- On-line leak detection

Visual Observations

Pursuant to *18 AAC 75.055(a)(3)*, Alyeska visually inspects the pipeline right-of-way every week, unless precluded by weather or safety considerations, via aircraft. The aerial surveillance includes areas downstream of buried pipeline stream crossings where sheens of oil or oil layers could be expected to surface from a leak.

Ground surveillance is carried out routinely in connection with maintenance, routine surveillance, and personnel movements along the pipeline. Four ground surveillances are conducted of the entire pipeline each year. These surveillances are scheduled to occur during the following time periods:

- Winter Season
- Spring Season
- Summer Season
- Fall Season

Non-pipeline people (military and civilian) may be in positions to survey the pipeline. Procedures have been established for non-Alyeska personnel to alert Alyeska in the event that an oil leak is noticed by them.

An Alyeska emergency phone number, staffed 24 hours a day, is listed in the following phone books:

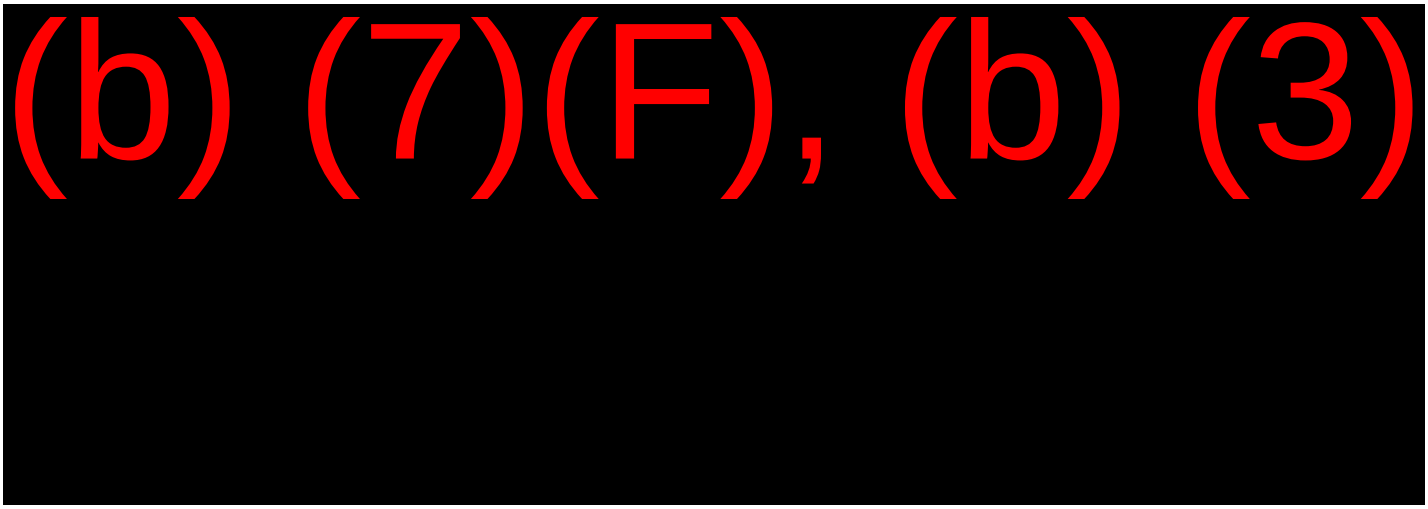
- Fairbanks (includes Delta Junction and North Pole)
- Glennallen
- Valdez

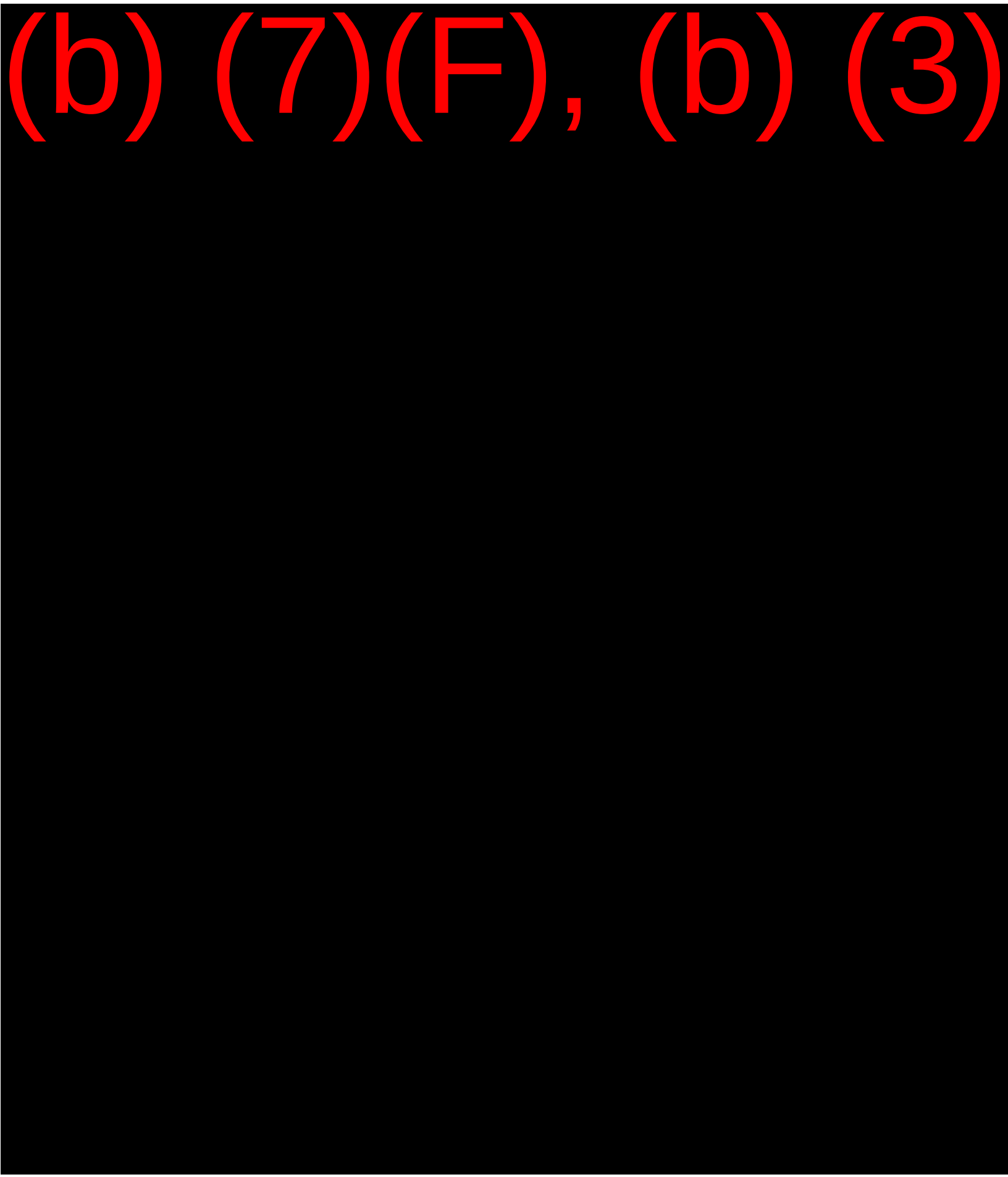
Currently, a telephone number at the Operations Control Center (OCC) is shown on the Department of Transportation (DOT) Pipeline Warning Signs for the general public to report emergencies.

These DOT warning signs are on the right-of-way at the following locations:

- Milepost markers (every mile on the belowground pipeline and every two miles on the aboveground pipeline)
- Trail and road crossings
- Cathodic protection test stations (construction)

Some streams have stream crossing signs located on both banks, and the OCC telephone number is listed on these signs.

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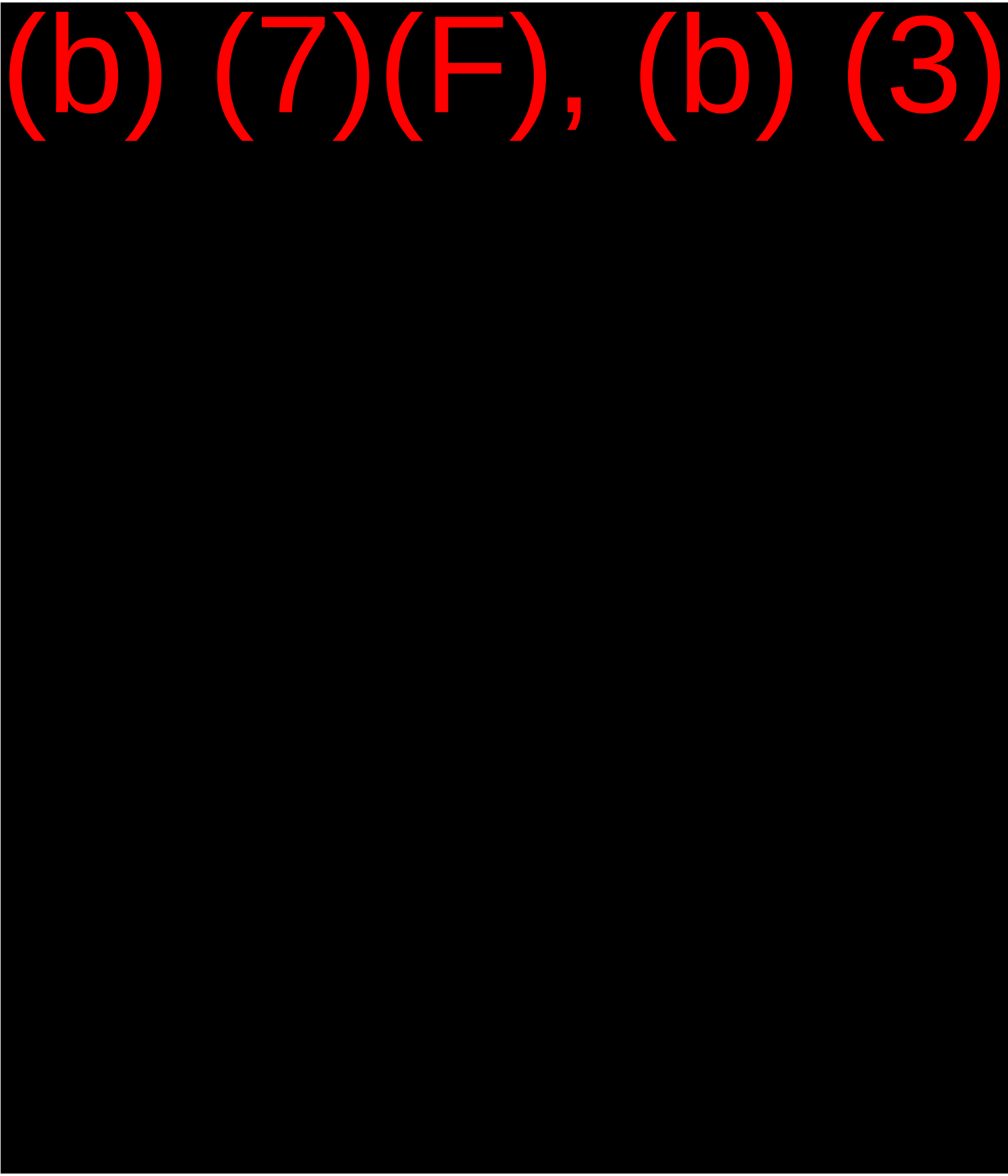
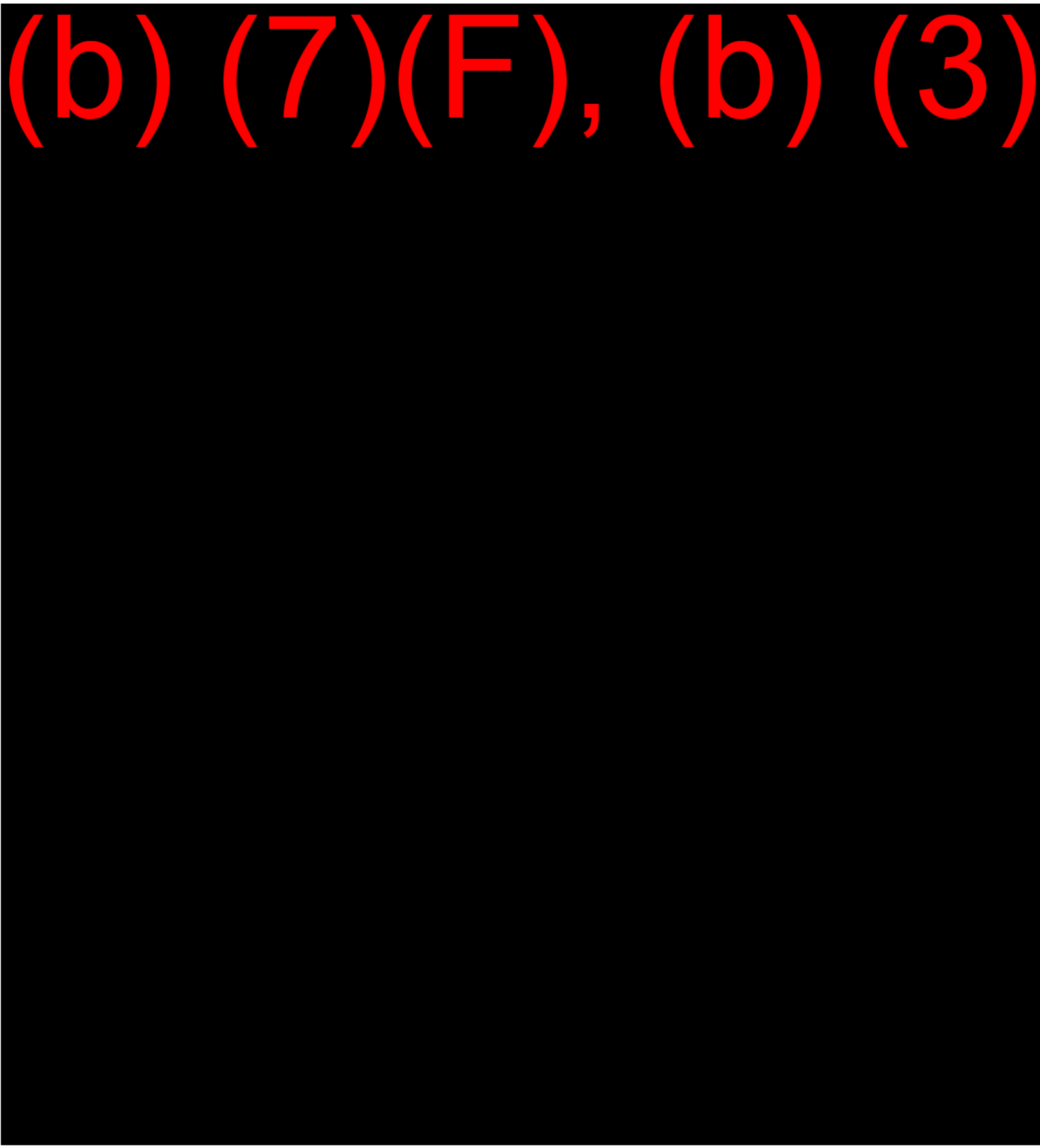

(b) (7)(F), (b) (3)


(b) (7)(F), (b) (3)


(b) (7)(F), (b) (3)


(b) (7)(F), (b) (3)

2.1.8.5 Out of Service Facility Piping [18 AAC 75.080(o)]

Pursuant to 18 AAC 75.080(o), facility oil piping removed from service for more than one year will be:

- Free of accumulated oil,
- Marked “Out of Service,”
- Marked with the date taken out of service,
- Secured to prevent unauthorized use, and
- Blank flanged or otherwise disconnected from facility piping.

In addition, Alyeska will notify the department when facility oil piping is removed from service and when the actions required above are complete.

2.1.9 Emergency Tow and Escort Vessel Programs

Not applicable.

2.1.10 Vessel and Barge Inspection and Maintenance Programs

Not applicable.

2.1.11 Summary of Regulatory Requirements for Prevention Measures

The following typical prevention measures are utilized on TAPS. Brief summaries of each required prevention measure are listed by the appropriate regulation, excluding *18 AAC 75*, “Oil and Hazardous Substances Pollution Control.”

The following sections are representative of the various regulations and specific requirements that provide or affect oil spill prevention measures. It is not intended to be a comprehensive list and is presented in summary form only. Refer to the referenced materials for the unabridged text.

2.1.11.1 Federal Agreement and Grant of Right-of-Way (1/23/94) as Directed by Trans-Alaska Pipeline Authorization Act (1973)

Paragraph 9.0	Construction plans, design plans, and quality assurance programs shall be approved by the Authorized Officer.
Paragraph 10.0	All construction of the pipeline shall comply with provisions of Notices to Proceed issued by the Authorized Officer.

2.1.11.2 Stipulations for Agreement and Grant of Right-of-Way (Appendix D, 1/23/74)

Paragraph 1.18.1	Conduct surveillance and maintenance program applicable to subarctic/arctic environment during construction, operation, maintenance, and termination of the pipeline system.

Paragraph 1.18.2	Provide communication system that ensures transmission of required information for safe operation of the pipeline system.
Paragraph 1.18.3	Maintain complete and up-to-date records of construction, operations, maintenance, and termination of activities.
Paragraph 1.18.4	Maintain access roads and airstrips to ensure access.
Paragraph 1.21.1	Perform system operations in safe and workmanlike manner to ensure safety and integrity of pipeline system.
Paragraph 2.4.1.1	Perform pipeline construction, operation, maintenance, and termination activities to avoid/minimize disturbance to vegetation.
Paragraph 2.4.1.2	Design shall provide control facilities to avoid/minimize erosion.
Paragraph 2.4.1.3	The pipeline shall be designed and operated to avoid disturbance to thermal regime.
Paragraph 2.14.2	Contingency plans shall be submitted to the Authorized Officer and must conform to stipulations and 36 FR 16215, “National Oil Hazardous Substances Pollution Contingency Plan” (NOHSPCP) (8/20/71).
Paragraph 3.2.1.1	Design, operation, maintenance, and termination shall be in accordance with safe and proven engineering practice and shall meet or exceed ANSI B31.4 and 49 CFR 195.
Paragraph 3.2.2.1	Provide for remotely controlled shutoff valves at pump station and pipeline locations to control spills based on resource values and area sensitivity.
Paragraph 3.2.2.3	Radiographically inspect all mainline girth welds and hydrotest pipeline.
Paragraph 3.2.2.4	Provide continuous inspection of construction to ensure compliance with approved designs.
Paragraph 3.2.2.5	All welder qualification tests shall be by destructive means.
Paragraph 3.3.1	Selection of aboveground versus belowground construction mode governed by strict criteria. Provide comprehensive system to monitor pipeline deformation.
Paragraph 3.4	Design pipeline to prevent oil leakage due to seismic events up to listed criteria. Provide ground motion detectors to monitor seismic events.
Paragraph 3.5.1	Pipeline shall be designed and routed to avoid slope instability.
Paragraph 3.6	Pipeline design shall include provisions for erosion control.

Paragraph 3.8.1	Pipeline routing shall avoid glacier surge zones.
Paragraph 3.9.1	Pipeline construction, operation, maintenance, and termination facilities shall be conducted to avoid/minimize thermal and other environmental changes.
Paragraph 3.10	Pipeline shall be designed and monitored to avoid and detect corrosion deterioration. Specific plans for approval shall be submitted as follows: 1. Pipeline materials and welding techniques 2. External pipe protection details 3. Plans for cathodic protection 4. Cathodic protection monitoring 5. Periodic surveys of trouble areas 6. Internal corrosion protection
Paragraph 3.11	Provide oil spill containment dikes around pump station and Terminal tanks.

2.1.11.3 Title 49, Code of Federal Regulations, Part 195

Part 195.102	Materials shall be chosen for appropriate temperature service.
Part 195.106	Internal design pressure capability shall conform to specific requirements.
Part 195.110	Pipeline shall be designed to withstand applicable external loads.
Part 195.112	Pipe shall be low alloy carbon steel.
Part 195.116	Pipeline valves shall conform to API Std 6D.
Part 195.120	Design shall accommodate passage of pipeline scrapers and inspection devices.
Part 195.204	Inspection shall be carried out by qualified personnel.
Part 195.206	Pipeline material shall be inspected at the site.
Parts 195.214 - 234	Pipeline welding shall conform to specific controls and testing criteria.
Parts 195.236 - 244	Pipeline and components shall be protected from external corrosion.
Parts 195.246 - 252	Belowground pipe installation shall conform to specific requirements.

Parts 195.258 - 260	Pipeline valve location and access shall meet specific guidelines.
Parts 195.300 - 310	Pipeline system shall be hydrostatically tested.
Part 195.402	Operator shall prepare and follow a manual of written procedures for operations and maintenance and emergencies.
Part 195.403	Operator shall establish and conduct a continuous emergency response training program.
Part 195.404	Operator shall maintain current maps and records of the pipeline system.
Part 195.408	Operator shall provide for a communication system for safe operation of the pipeline.
Part 195.410	Operator shall provide regular pipeline markers along the pipeline and at road/river crossings.
Part 195.412	Pipeline operator shall inspect right-of-way and waterway crossings regularly.
Part 195.420	Operator shall maintain all pipeline valves and inspect twice per year.
Part 195.428	Operator shall provide pressure limiting devices and shall inspect/test them annually.
Part 195.501 – 509	Qualification of Pipeline Personnel
Part 195.551 – 589	Corrosion Control

2.1.11.4 Title 49, Code of Federal Regulations, Part 199, “Drug Testing”

Various Parts	Covered employees will be subject to pre-employment, random, and post-accident drug testing using special collection and testing procedures.

2.1.11.5 ASME/ANSI B31.4, “Transportation of Hydrocarbons by Pipeline”

Paragraph 402.2	Internal and external design pressure criteria
Paragraph 402.3	Allowable stress limits
Paragraph 405.2.1	Steel pipe requirements
Paragraph 419	Pipe expansion requirements
Paragraph 423	General material requirements
Paragraph 434.1 - 7	Pipe construction and handling requirements

Paragraph 434.8	Welding requirements
Paragraph 434.10 and 434.11	Belowground pipe installation criteria
Paragraph 451.5	Pipeline surveillance required
Paragraph 451.6.2	Criteria provided to calculate allowable working pressure of corroded pipe
Paragraph 454	Requirement for emergency plans in case of system failure

2.2 DISCHARGE HISTORY [18 AAC 75.425(e)(2)(B)(i)]

From June 1, 1977 to December 31, 2010, a total of 168 spills greater than 55 gallons have been recorded along TAPS. Table 2-7 shows spill release frequencies sorted by location and cause. Approximately one-third (59) of the spills were diesel. The next three most commonly released substances were crude oil (40 spills), turbine fuel (33 spills), and miscellaneous (21 spills). The information in Table 2-8 is presented graphically as Figure 2-1 and Figure 2-2.

Table 2-8 indicates the primary cause and location of each spill for six substance categories:

- Crude
- Diesel
- Drag reducing agent (DRA)
- Gasoline
- Turbine fuel
- Miscellaneous

Miscellaneous substances primarily include therminol and hydraulic oil with a few instances of jet fuel, brine, and waste oil. Table 2-9 provides a summary of crude oil spills that occurred along the pipeline itself, excluding spills at the pump stations, and all non-crude oil spills.

Figure 2-1 and Figure 2-2 present the data by location and cause, respectively. From Figure 2-1, it can be seen that the greatest number of spills occurred [redacted] and the pipeline segment between [redacted] and [redacted]. These four locations accounted for 78 of the 168 total spills (46%). The listing of most significant causes of spills is illustrated in Figure 2-2. The most common spill cause is equipment failure (approximately 17% of the spills). The following four causes are responsible for approximately 55% of the spills:

- Equipment failure (28)
- Valve related (24)
- Fuel line failure (21)
- Fuel transfer (20)

Figure 2-3 presents the data by year. Review of this figure indicates that, with the exception of 1984 and 1992, generally fewer spills occurred each year during the last 20 years than during the late 1970s and early 1980s. Review of the spill data reveals further that 6 of the 12 spills reported during 1992 were, in fact, compilations of many small historical spills. Therefore, the 12 spills reported for 1992 are misleading; only 6 discrete spill events were reported during 1992.

A complete listing of all spill events from June 1977 through December 2010 that are greater than 55 gallons is provided in Table 2-10. Some observations regarding the data compiled in these tables are as follows:

- Spills of 55 gallons or more are more prevalent at pump stations, occurring at more than twice the rate of spills along the pipeline.

- Between 1977 and 2005, spills along the pipeline accounted for 94% of the total volume spilled. The two sabotage events account for 64% of the total volume spilled. Since 2006, this trend has changed and 99% of the total spill volume is from spills that occurred at pump stations. The 2010 spill (b) (7) (F) (b), Tank 190 into secondary containment, accounts for 99% of that volume.

TABLE 2-7 SPILL RELEASE COUNT SORTED BY LOCATION AND CAUSE (JUNE 1977 TO DECEMBER 2010)

Reason Categories	PS01	PS01 to PS02	PS02	PS02 to PS03	PS03	PS03 to PS04	PS04	PS04 to PS05	PS05	PS05 toPS06	PS06	PS06 to PS07	PS07	PS07 to PS08	PS08	PS08 to PS09	PS09	PS09 to PS10	PS10	PS10 to PS11	PS11	PS11 to PS12	PS12	PS12 to VMT	Total
Accident					2																				**2**
Break								1		1	1											1			**4**
Corrosion	2								1																**3**
Equipment failure	3	1	2		2		2	3	2		1		1	1	1		2		7						**28**
Explosion															1										**1**
Fuel Line Failure	1	1	2	1	3	1		3	1		3	1		2					1				1		**21**
Fuel Transfer	1						1	1	2		5		1	1	4		1		2				1		**20**
Helicopter Drop		1																							**1**
Human Error	3		1				1		2		1						1		2						**11**
Overflow	2																2		3						**7**
Rail Accident																									**0**
Sabotage												1		1											**2**
Tank	2				1		1	2	2		1								2				1		**12**
Unknown	2				2	1	2			1	3			1			3		2		1		1		**19**
Valve	2	3	2			1		6		1	2			1					3	2			1		**24**
Vehicle Accident						1		4		1						1		1		2		1			**12**
Vehicle Leak																									**0**
Weld Failure											1														**1**
Total	**18**	**6**	**7**	**2**	**10**	**4**	**7**	**20**	**10**	**4**	**18**	**2**	**2**	**7**	**6**	**1**	**9**	**1**	**22**	**4**	**1**	**2**	**5**	**0**	**168**

TABLE 2-8 HISTORICAL SPILL COUNT BY LOCATION, CAUSE, AND SUBSTANCE (JUNE 1977 TO DECEMBER 2010)

Reason Categories	PS01	PS01 to PS02	PS02	PS02 to P0S3	PS03	PS03 to PS04	PS04	PS04 to PS05	PS05	PS05 to PS06	PS06	PS06 to PS07	PS07	PS07 to PS08	PS08	PS08 to PS09	PS09	PS09 to PS10	PS10	PS10 to PS11	PS11	PS11 to PS12	PS12	PS12 to VMT	Total
Crude																									
Break								1		1	1											1			4
Equipment Failure	2		1		1		1	1											2						8
Explosion															1										1
Human Error			1				1		1																3
Unknown	1																								1
Overflow	2																2		3						7
Sabotage												1		1											2
Valve	1	2	1			1		2	1					1					2	2			1		14
Total	**6**	**2**	**3**	**0**	**1**	**1**	**2**	**4**	**2**	**1**	**1**	**1**	**0**	**2**	**1**	**0**	**2**	**0**	**7**	**2**	**0**	**1**	**1**	**0**	**40**
Diesel																									
Accident					2																				2
Equipment Failure					1			1			1								1						4
Fuel Line Failure	1	1	1	1	2	1		3			2	1		2									1		16
Fuel Transfer	1							1	1		2				1				1				1		8
Helicopter Drop		1																							1
Human Error	1																								1
Tank	1				1			1	2										2						7
Unknown	1				2	1				1				1					1		1				8
Valve		1	1					1																	3
Vehicle Accident				1				3		1								1		1		1			8
Vehicle Leak																									0
Weld Failure											1														1
Total	**5**	**3**	**2**	**2**	**8**	**2**	**0**	**10**	**3**	**2**	**6**	**1**	**0**	**3**	**1**	**1**	**0**	**0**	**5**	**1**	**1**	**1**	**2**	**0**	**59**

TABLE 2-8 (CONTINUED) HISTORICAL SPILL COUNT BY LOCATION, CAUSE, AND SUBSTANCE (JUNE 1977 TO DECEMBER 2010)

Reason Categories	PS01	PS01 to PS02	PS02	PS02 to PS03	PS03	PS03 to PS04	PS04	PS04 to PS05	PS05	PS05 to PS06	PS06	PS06 to PS07	PS07	PS07 to PS08	PS08	PS08 to PS09	PS09	PS09 to PS10	PS10	PS10 to PS11	PS11	PS11 to PS12	PS12	PS12 to VMT	Total
Drag Reducing Agent (DRA)																									
Equipment Failure																	1		1						2
Human Error									1		1								1						3
Rail Accident																									0
Tank							1																		1
Unknown																	1								1
Valve								3											1						4
Total	0	0	0	0	0	0	1	3	1	0	1	0	0	0	0	0	2	0	3	0	0	0	0	0	11
Gasoline																									
Equipment Failure							1																		1
Fuel Transfer														1											1
Tank	1										1														2
Vehicle Accident																									0
Total	1	0	0	0	0	0	1	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	4
Turbine Fuel																									
Equipment Failure									1				1		1		1		3						7
Fuel Line Failure									1										1						2
Fuel Transfer							1		1		3		1		3		1		1						11
Human Error																	1		1						2
Tank																							1		1
Unknown							1				3						1		1				1		7
Valve											1														1
Vehicle Accident								1										1							2
Vehicle Leak																									0
Total	0	0	0	0	0	0	2	1	3	0	7	0	2	0	4	0	4	1	7	0	0	0	2	0	33

TABLE 2-8 (CONTINUED) HISTORICAL SPILL COUNT BY LOCATION, CAUSE, AND SUBSTANCE (JUNE 1977 TO DECEMBER 2010)

Reason Categories	PS01	PS01 to PS02	PS02	PS02 to P0S3	PS03	PS03 to PS04	PS04	PS04 to PS05	PS05	PS05 to PS06	PS06	PS06 to PS07	PS07	PS07 to PS08	PS08	PS08 to PS09	PS09	PS09 to PS10	PS10	PS10 to PS11	PS11	PS11 to PS12	PS12	PS12 to VMT	Total
Miscellaneous																									
Corrosion	2								1																**3**
Equipment Failure	1	1	1					1	1					1											**6**
Human Error	2																								**2**
Line Failure			1		1						1														**3**
Tank								1																	**1**
Unknown																	1								**1**
Valve	1										1														**2**
Vehicle Accident						1														1					**2**
Total	**6**	**1**	**2**	**0**	**1**	**1**	**0**	**2**	**2**	**0**	**2**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**20**

TABLE 2-9 HISTORICAL SPILL COUNT OF CRUDE OIL FROM THE MAIN PIPELINE BY LOCATION AND CAUSE (JUNE 1977 TO DECEMBER 2010)

Reason Categories	PS01	PS01 t o PS02	PS02	PS02 to PS03	PS03	PS03 to PS04	PS04	PS04 to PS05	PS05	PS05 to PS06	PS06	PS06 to PS07	PS07	PS07 to PS08	PS08	PS08 to PS09	PS09	PS09 to PS10	PS10	PS10 to PS11	PS11	PS11 to PS12	PS12	PS12 to VMT	Total
Crude from Pipeline																									
Break								1		1												1			**3**
Equipment Failure								1																	**1**
Explosion															1										**1**
Human Error																									**0**
Unknown																									**0**
Overflow																									**0**
Sabotage												1		1											**2**
Valve		2				1		2						1						2					**8**
Total	**0**	**2**	**0**	**0**	**0**	**1**	**0**	**4**	**0**	**1**	**0**	**1**	**0**	**2**	**1**	**0**	**0**	**0**	**0**	**2**	**0**	**1**	**0**	**0**	**15**

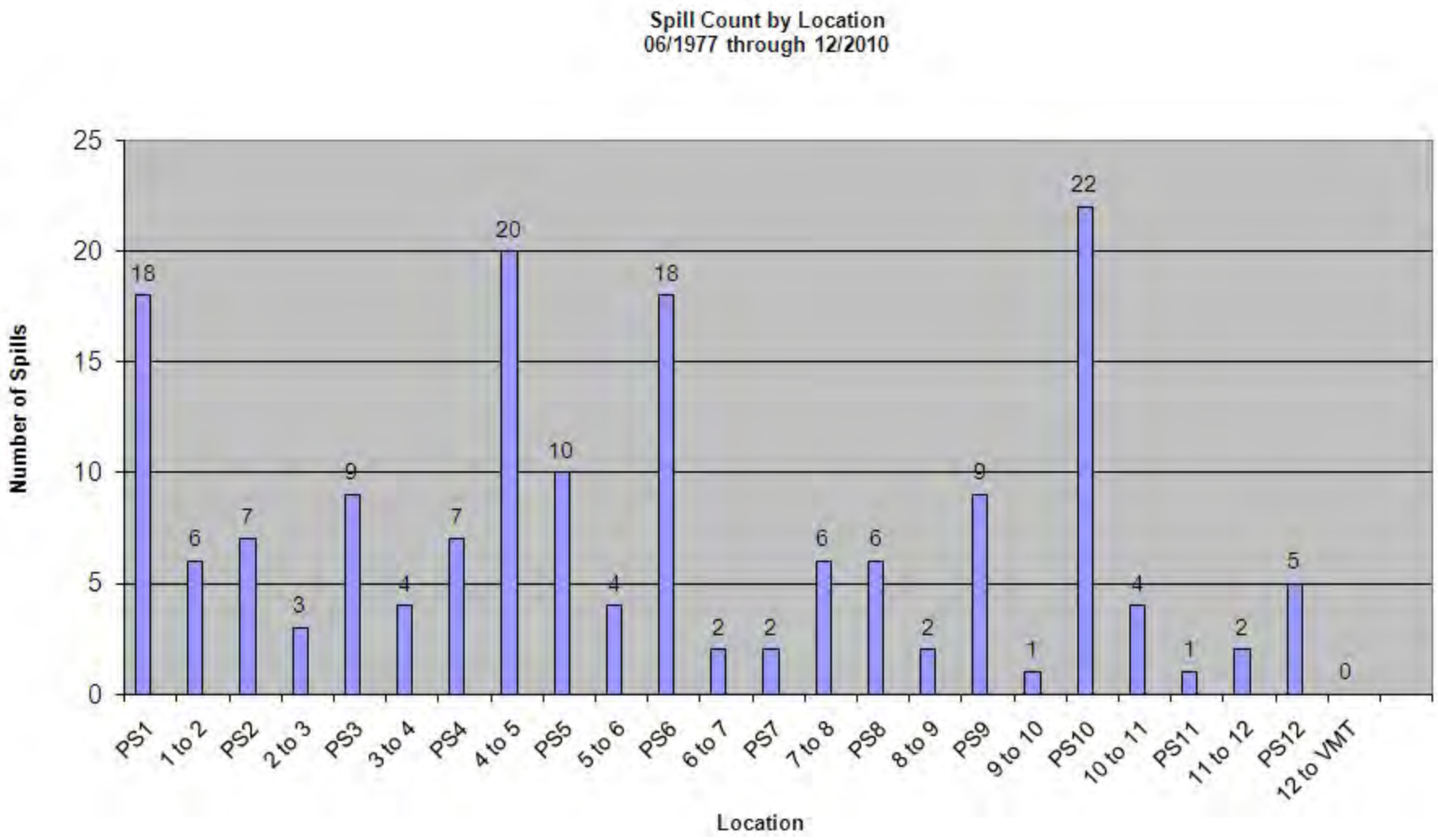


FIGURE 2-1 SPILL FREQUENCY SORTED BY LOCATION (JUNE 1977 THROUGH DECEMBER 2010)

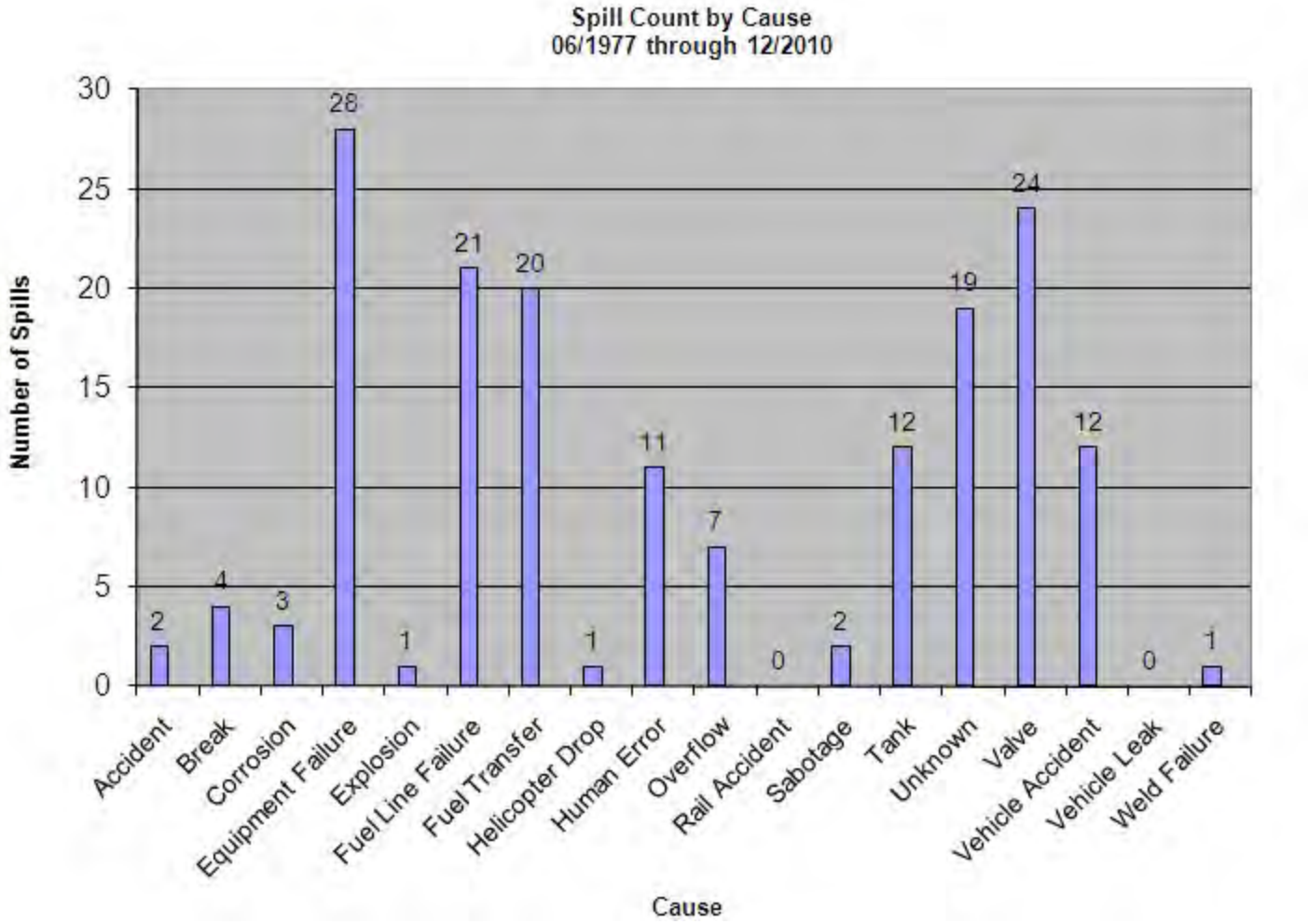


FIGURE 2-2 SPILL FREQUENCY SORTED BY CAUSE (JUNE 1977 THROUGH DECEMBER 2010)

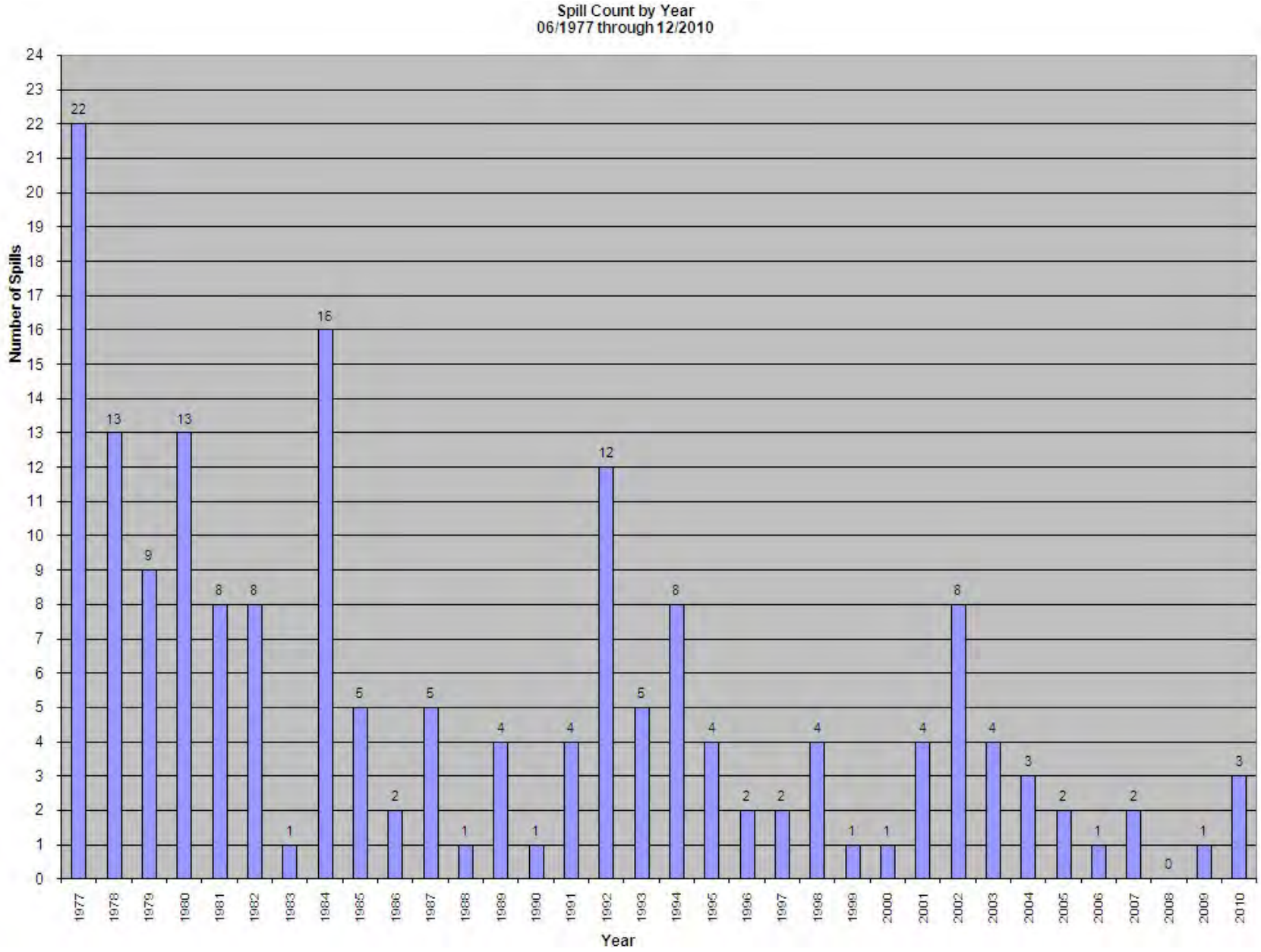


FIGURE 2-3 SPILL FREQUENCY SORTED BY YEAR (JUNE 1977 THROUGH DECEMBER 2010)

TABLE 2-10 ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
			(b) (7)(F), (b) (3)	tal Number of Spills 168		
6/1/77	Diesel Fuel	(b) (7)(F), (b) (3)		Fuel line leak	Unknown	2 spills while decommissioning camp's fuel lines.
6/20/77	Diesel Fuel			Valve leak	Visual	
6/23/77	Diesel Fuel			Vehicle wreck	Unknown	Truck lost breaks and had to leave roadway.
7/5/77	Therminol			Valve steam packing leak	Visual	(See 9/1 letter to DEC).
7/8/77	Crude Oil			Explosion	Visual	(b) (7)(F), (b) (3) recovered. Fire associated with explosion burned a lot of the spilled oil.
7/9/77	Gasoline			Cracked storage tank	Visual	(See 9/1 letter to DEC) Also, BLM database listed quantity as 6,600.
7/11/77	Gasoline			Fuel truck overfill	Visual	PLMP approximate. No cleanup info.
7/14/77	Crude Oil			Valve leak	Visual	Lkng cv flange btwn swag tank & injctn bldg.
7/19/77	Crude Oil			Valve damage	Visual	(b) (7)(F), (b) (3)) Cleanup: oiled soil, gravel, water spread on Haul Road; oil reinjected to pipeline, absorbents to MS132-2B burn box.
7/24/77	Diesel Fuel			Rock hit fuel/tank, tank truck	Visual	APSC database has spill volume=60 gal. Cleanup: sorbents, contaminated soil stored in lined area at 21-7 for future disposal.
8/1/77	Diesel Fuel			Line leak	Visual	Absorbents burned in PS12 incinerator.
8/15/77	Crude Oil			Sump overflow	Visual	Drain & vent lines left open when unit 2 started (APSC database has volume-1050 gal).
8/16/77	Crude Oil			Sump overflow	Unknown	
8/24/77	Diesel Fuel			Tank leak	Unknown	Possible temp. portable tank.
9/8/77	Turbine Fuel			Unknown	Unknown	

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
9/12/77	Diesel Fuel	(b) (7)(F), (b)(3)	(b) (7)(F), (b) (3)	Overturned tank truck	Visual	PLMP approximate. Cleanup: diesel burned and road surface tilled.
9/12/77	Diesel Fuel			Drain valve open	Visual	(b) (7)(F), (b) (3)
10/3/77	Diesel Fuel			Overturned fuel truck	Visual	Tank truck overturned.
10/11/77	Crude Oil			Leaking seal on CKV 68A	Visual	Cleanup: berm constructed to protect creek. No info on disposition of oil waste materials.
12/1/77	Diesel Fuel			Line frozen	Unknown	Fuel tank nozzle froze while filing day tank.
12/16/77	Diesel Fuel			Tanker overfilled	Visual	
12/30/77	Turbine Fuel			Vehicle wreck	Visual	(b) (7)(F), (b) (3)
1/8/78	Diesel Fuel			Fuel line broke	Visual	Two-inch hose from diesel fuel line broke. Spill contained within building.
1/31/78	Jet Fuel			Fuel tanker leak	Visual	Contaminated snow removed from airport, stored in lined area at MS 92-3.1.
2/3/78	Crude Oil			Sump pump failure	Visual	Sump pump failure.
2/11/78	JP 4			Tanker leak	Unknown	
2/15/78	Crude Oil			Sabotage	Visual	(b) (7)(F), (b) (3) .
3/7/78	Crude Oil			Overflow	Visual	Ltr 78-360-G; Overflow pump near sump vent.
3/25/78	Crude Oil			Frozen Valve	Unknown	
4/4/78	Diesel Fuel			Cracked Weld	Unknown	
5/4/78	Waste Oil			Equipment Leak	Unknown	PLMP approximate.
7/23/78	Diesel Fuel			Leaky gnrator fuel connection	Visual	Cleanup: sorbent pads burned, contaminated gravel spread on Mukluk Pad.
9/16/78	Turbine Fuel			Faulty meter	Visual	

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
10/19/78	Turbine Fuel	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Equipment leak	Visual	
10/25/78	Diesel Fuel			Line break	Visual	DOT spill. Diesel and snow burned (b) (7).
1/1/79	Crude Resid			Line break	Visual	Ltr 79-882-G; Split seam on 2-in. Condensate line; Contaminated cleanup materials to MS79-1.
3/7/79	Crude Oil			Unknown	Unknown	
5/17/79	Diesel Fuel			Line leak Northland Construct.	Visual	Cracked fuel line, volume reduced from 3740 gallons (originally reported). Plan to get permit to place recovered diesel on Haul Rd.
6/10/79	Crude Oil			Line break	Visual	Recovered crude reinjected into pipeline, sorbents and contaminated sand/gravel removed to lined pits at MS-117-1B.
6/15/79	Crude Oil			Mainline pipe crack	Visual	(b) (7)(F), (b) (3) .
7/6/79	Diesel Fuel			Line break	Unknown	
7/8/79	Turbine Fuel			Valve break	Visual	
8/31/79	Turbine Fuel			Vehicle wreck	Unknown	
12/8/79	Turbine Fuel			Mechanical	Visual	Glass filter bowl broke.
1/5/80	Crude Oil			Vent discharge	Unknown	Power outage, backflow out of the topping unit caused spill.
1/17/80	Diesel Fuel			Line frozen	Visual	APSC dbase indicates 30 gal spilled due to frozen return fuel line. Our report also indicates 30 gal.
1/24/80	DRA			Relief valve open	Visual	BLM dbase had stated defective relief valve as cause.
2/5/80	Crude Oil			Sump overflow	Visual	Power outage, backflow out of the topping unit caused spill.
2/19/80	Turbine Fuel			Tanker overfilled	Visual	Tanker overflow

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
5/12/80	Crude Oil	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Relief tank valve leak	Visual	Tank 200 Discharge (line shut down) – spill contained within diked tank area.
5/18/80	Crude Oil			Valve leak while checking	Visual	Possible vlv body seal leak or seating prblm.
5/29/80	Diesel Fuel			Leaking valve	Visual	Leaking drain valve on day tank.
7/8/80	Crude Oil			Tank overfilled	Visual	Resid tank overflow rcvrd 175 gal.
7/8/80	Turbine Fuel			Fbrglss tank crack-buried Leak	Visual	Status report from DA Holland indicates this spill date as 1/13. Spill spanned 7/8-7/13.
9/21/80	Turbine Fuel			Overfill and leak	Visual	Tank overfill/leaky hatch gasket. Initial discharge msg. lists quantity as 100 gal.
9/25/80	Turbine Fuel			Mechanical	Visual	2 in. flange wo/gasket and torque.
10/28/80	Crude Oil			Leaking vent plug	Visual	Leaking vent plug on 36 in. ball valve.
1/1/81	Crude Oil			Valve failure	Visual	Cleanup: Vac truck picked up pooled oil. Oiled snow, gravel sorbents burned near site in burn tanks. Residual water stored in line POL, Galbraith.
3/30/81	Turbine Fuel			Tank overfilled	Visual	Cleanup spread gravel on Johnson Road.
5/9/81	Turbine Fuel			Broken fuel line	Visual	Spill discovered/reported on 06/18. Records for both spills are filed as 5/9/81. 26 bbls spilled, 3 bbls recovered. Recovered fuel/water mixture "spread to temp. camp."
7/6/81	Diesel Fuel			Unknown	Visual	Old fuel facility. Date given is date of discovery. Exact quantity unknown.
7/19/81	Diesel Fuel			Pump dispensary hose leak	Visual	Absorbent pads picked up approx. 99 gal of spill.
8/30/81	Turbine Fuel			Line frozen	Visual	Valve left open on frozen line.
10/23/81	Diesel Fuel			Vehicle wreck	Unknown	PLMP approximate. Not in APSC dbase, Third part spill??
12/5/81	Crude Oil			Leaking check valve, sump back	Visual	Contaminated material to Oxbow landfill (NSB).

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
1/18/82	Diesel Fuel	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Human error	Visual	Discharge hose came off; tank valve had been left open on fuel truck.
1/25/82	Crude Oil			Crack in bleed valve connection	Visual	(b) (7)(F), (b) (3)
2/5/82	Diesel Fuel			Overfilled storage tank	Visual	Spill confined to interior of tank farm. No areas outside tank farm affected.
6/20/82	Diesel Fuel			Valve leak	Visual	Valve on tank partially open. Date given here is date of discovery; date of spill unknown. Contaminated material placed on Dalton Highway, sorbents incinerated (b) (7)(F), camp.
7/21/82	Crude Oil			Human error	Visual	Relief valve inadvertently removed during a PM.
9/13/82	Turbine Fuel			Line cut	Visual	Oil Turbine fuel line was cut, left open (BLM database has date=9/14/82).
11/18/82	Turbine Fuel			Human error	Visual	Valve to blowdown drum left open, fuel inadvertently pumped straight to blowdown drum & overflowed drum.
11/26/82	Hydraulic Fluid			Damaged hose	Visual	Contaminated snow and material hauled to PS05 and stored in OMS 91-3.1.
1/19/83	Diesel Fuel			Tank leak	Fuel Acctng	Fiberglass tank leak (2/15/85, 85-3904-G monitoring sump).
3/24/84	Diesel Fuel				Unknown	PLMP. approximate. BRD WO/CVRD NPL.
5/4/84	Crude Oil			Seal failure	Visual	5/14/85-3669-G, O Ring seal failure.
5/17/84	Crude Oil			Leaking drain plug	Visual	Contaminated materials to Slope Mtn DOT.
5/20/84	Diesel Fuel			Tank Crack	Visual	2/15/85, 85-3904-G, Interim rpt 84-3676-G 5/20/84.
5/23/84	DRA			Blown rupture disk on tank	Visual	Letter 6/4/84, 84-3685-G; DRA shipped Alaska Environmental Industries, Inc. (Kenai) for disposal.
5/24/84	Turbine Fuel			Fuel transfer	Visual	6/24/84, 84-3685-G tank overflow

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
6/13/84	Diesel Fuel	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Defective safety plug	Visual	6/19/84 84-3699-G safety plug defective.
6/18/84	Turbine Fuel			Tank overfill	Visual	7/9/84, 84-3714G tank overfill.
7/2/84	Diesel Fuel			Vehicle wreck	Visual	(b) (7)(F), (b) (3)
8/10/84	Diesel Fuel			Tank Overfilled	Visual	Tank overfilled: 75 gal to ground, 75 gal tanker runway (8/20/84,84-3748-G)
9/2/84	Diesel Fuel			Broken pipe fitting	Visual	Broken pipe fitting.
10/14/84	Turbine Fuel			Truck loading error	Visual	10/25/84, 84-3805-G falty flt sw+lk btwn cmpt.
10/25/84	Diesel Fuel			Broken fuel hose	Visual	PLMP approximate. Letter: 84-3810-G.
11/21/84	Therminol			Cracks in pipe	Visual	
11/28/84	Turbine Fuel			Fuel transfer	Visual	11/24/84, 84-3867-G stop mtr fld+popup swt fl.
12/31/84	Diesel Fuel			Leaking tank	Visual	PLMP=southern limit of spill. Letter: 85-3915-G. Cleanup sorbent pads used to pick up diesel, sorbents burned a (b)
1/22/85	Crude Oil			Hose fitting failure	Visual	(b) (7)(F), (b) (3) incinerator, oil snow stored in bermed area.
2/14/85	DRA			Tanker relief valve	Visual	
4/10/85	Diesel Fuel			Tank leak	Visual	PLMP=southern limit of leak. Leaking sight glass on steam unit. Cleanup: none, diesel dripped on highway for 56 miles.
9/16/85	Therminol			Line leak	Visual	Broken underground ½ inch line between booster pump bldg and ditch below tankfarm dike (b) (7)(F), (b) gal spill reported).
11/15/85	Diesel Fuel			Overfilled tank	Visual	Contaminated snow and sorbents burned at PS05 per conversation with John Janssen.
9/2/86	Therminol			Corrosion	Visual	Corrosion-3/4" tubing, heat trace line therminol.

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
9/12/86	DRA	[redacted]	[redacted]	Valve failure	Visual	[redacted] burned.
3/27/87	DRA			Regulator failure	Visual	Ltr: 87-4738-G; nitrogen regulator failed open-forcing DRA out.
7/13/87	Turbine Fuel			Truck overfilled	Visual	Inexperienced operator attempting to prove meter. Cleanup: sorbents, remove gravel to fire training burn pit.
7/13/87	Turbine Fuel			Truck Overfilled	Visual	Tanker trailer overflow - ran out thru dome. Spill in containment area. Fuel picked up with vac truck and sorbents. Contam. material spread around shop bldg. and helo pad.
8/7/87	Gasoline			Defective fittings	Visual	Hose fitting came loose. Cleanup: sorbents used, incinerated [redacted]
8/16/87	Diesel Fuel			Splint tank seam	Visual	PLMP=southern limit of spill. Leaking seam on generator skid fuel tank.
6/17/88	Diesel Fuel			Dropped from helicopter	Visual	180 gal drum dropped, 120 gal remained in drum. Alascom helicopter. Sorbents used, [redacted] incinerator
8/8/89	Diesel Fuel			Fitting Leak	Visual	Database gave quantity of [redacted] NSB Oxbow Landfill.
8/23/89	Crude Oil			Valve stem leak	Visual	Ltr 89-7053-G; leak on discharge relief valve stem.
9/14/89	Hydraulic Fluid			Vehicle wreck	Visual	Mixture of hydraulic fluid/motor oil/antifreeze.
9/26/89	Diesel Fuel			Mechanical	Visual	Ltr: 7053-G; diaphragm ruptured on pressure valve on fuel bypassline.
8/18/90	Corrosion INH/			Cut line	Visual	Ltr: 92-4796
5/29/91	Turbine Fuel			Fitting leak	Visual	Ltr: 92-4242; loose elbow fitting allowed fuel to leak from fuel line in construction trench.

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
6/29/91	DRA	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Personal error	Unknown	
7/10/91	Diesel Fuel			Unknown	Unknown	Unknown source; fuel found in snow melt water.
7/15/91	DRA			Slop tank overflow	Unknown	Spill # 1991255.
1/8/92	Crude Oil			Valve leak	Visual	Ltr: 92-4795; Tank 200 gasket failure during repair.
2/15/92	Hydraulic Fluid			Hydraulic line rupture	Visual	Ltr: 92-4306.
5/11/92	Diesel Fuel			Many small leaks	Visual	Soil remediation project, Ltr: 92-4795
5/12/92	Turbine Fuel			Many small leaks	Unknown	Spill #1992074
7/3/92	Turbine Fuel			Many small leaks	Unknown	Spill #1992151
7/24/92	Turbine Fuel			Many small leaks	Visual	Spill #1992158, Ltr: 92-4796
8/2/92	Turbine Fuel			Tank overfilled	Unknown	Spill #1992188
8/8/92	Diesel Fuel			Many small leaks	Visual	Soil remediation project, Ltr: 92-4796, spill # 1992193
8/17/92	Turbine Fuel			Unknown	Visual	Soil remediation project, Ltr: 92-4796, spill # 1992206
8/21/92	Turbine Fuel			Tank Overflow	Visual	Faulty dip stick; Ltr: 92-4796, spill # 1992213
9/20/92	Turbine Fuel			Many small leaks	Unknown	Spill #1992262
12/14/92	Gasoline			Crack in tank weld	Unknown	Spill #1992348
1/17/93	Diesel Fuel			Unknown	Visual	Unaccountable loss on fuel oil report; 20 bbls released.
5/28/93	Crude Oil			Valve box-grease fitting leak	Unknown	Spill # 1993151
9/29/93	Turbine Fuel			Line break	Unknown	
11/9/93	Lube Oil			Broken supply line	Visual	All spilled gallons recovered; spill # 1993413.
11/27/93	DRA			Thermal expansion	Unknown	
1/6/94	Therminol			Valve left open	Visual	Ltr: 95-6653; personnel error, one quart to ground, APSC spill # 1994006.

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
2/26/94	Crude Resid	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Tank overflow	Visual	Tank high level indicator switch was broken; APSC spill #1994091.
3/21/94	Turbine Fuel			Turbine fuel skid fitting Fail	Visual	Spill # 1994137.
7/24/94	Diesel Fuel			Tanker overfilled	Unknown	
8/22/94	Diesel Fuel			Fuel line air sep. failure	Unknown	Spill #199461.
8/24/94	Brine			Personnel error	Unknown	Spill #199465.
10/28/94	Brine			Pump seal failure	Visual	Ltr: 95-6783, spill #1994570.
11/24/94	Crude Oil			Valve open	Visual	Ltr: 95-6783, spill #1994605.
2/6/95	DRA			Open drain valve	Visual	Ltr: 95-6924; Spill to containment; APSC spill # 199038.
4/29/95	Diesel Fuel			Hole in tank bottom	Unknown	Spill # 1995107.
6/16/95	Crude Oil			Internal diaphragm distorted	Unknown	An internal diaphragm distorted during restart.
8/26/95	Therminol			Supply line corrosion	Unknown	Spill # 1995165
4/20/96	Crude Oil			Loose line fitting	Unknown	Loose threaded fitting on bypass line. Duration of spill unknown. Spill Number 1996045, as of 2/5 (b) (7)(F), (b) recovered.
9/3/96	DRA			Relief valve opened	Unknown	Spill Number 1996109; as of 10/4/97 (b) gallons recovered.
9/3/97	DRA			Failed discharge butterfly valve during disconnection DRA Tanker #6089	Unknown	Spill Number 1997096.
9/25/97	Diesel			Unknown	Visual	Spill Number 1997114 – discovered during fiber optic excavation (Historical Spill).
4/2/98	Diesel			Float stuck on day diesel truck	Visual	Spill Number 1998034.
7/31/98	Diesel			Unknown	Unknown	Spill Number 1998068 – Historical Spill.
8/27/98	BTT Solids			Truck carrying sludge to FBKS ran off the road	Visual	Spill Number 1998083.
8/30/98	Therminol			Unknown – Suspect Leaky Valve Box	Unknown	Spill Number 1998115 – Historical Spill.

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments
5/3/99	Diesel	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary garret gen#3 fuel line to shuttle broke (assumed cause by fatigue)	Unknown	Spill Number 1999035.
12/13/00	Diesel			Procedure flaw	Unknown	Spill Number 2000077.
9/22/01	Crude Oil			Button heat fitting installation error	Visual	Spill contained in building.
9/22/01	Crude Oil			Improper energy isolation	Visual	(b) (7)(F), (b) (3)
10/4/01	Crude Oil			Sabotage (bullet hole)	Visual	
12/17/01	Diesel fuel			Fuel Line Failure	Unknown	Incident Number: 2001107; Spill Source: Generator Fuel Supply Line.
1/1/02	Brine			Corrosion	Unknown	Incident Number: 3573 and 2002001; Spill Source: Unknown, But Isolated To Shop Whse Fixed Brine Refrig Loop.
4/17/02	Oily Water			Equipment Failure	Unknown	Incident Number: 3601
5/9/02	Oily Water			Equipment Failure	Unknown	Incident Number: 3605; Leak at flange in 16" IWWS from ETF/PV area to BWT headers.
5/15/02	Oily Water			Pressurization on 5/9	Unknown	Incident Number: 3611
9/20/02	Turbine Fuel			Equipment Failure	Unknown	Incident Number: 5357; PC Spill - Approx. 15 GL Outside Containment On Gravel Pad; Spill Source: PS005 Equipment Shop Boiler Gauge Leak.
12/12/02	Oily Water			Equipment Failure	Unknown	Incident Number: 4036; oily water leaked from pipeline insulation, later determined to be leaking from a hole in low point drain.
12/13/02	Ballast Water			Equipment Failure	Unknown	Incident Number: 2002115; during TK 93 hydrotest, valve flange leaked.
12/31/02	Oily Water			Equipment Failure	Unknown	Incident Number: 4039; leak at valve flange when filling TK 93. This was a new valve installation.
5/13/03	Lube Oil			Human Error	Unknown	Incident Number: 4721; Spill Source: Mainline Pump Lube Oil Cooler

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments	
7/23/03	Oily Water	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Corrosion	Unknown	Incident Number: 4977; Hole in line caused by corrosion.	
9/29/03	Oily Water			Equipment failure	Unknown	Incident Number: 5305; Sump was out of service at the time. Heavy rains caused sump to rise faster than normal and overflowed before Vac Truck arrived for pumping. Water entered culvert and flowed into settlement pond. No sheen was observed in the pond.	
11/20/03	Acidic Flue Gas Condensate			Unknown	Unknown	Incident Number: 2003038; Removing pipe flange for maintenance.	
5/29/04	Diesel Fuel			Unknown	Unknown	Incident Number: 6329; Spill Source: Spill Response Boat, 28 Foot LCM APSC # 3468, Diesel Fuel Tanks.	
11/20/04	Diesel Fuel			Vehicle Accident	Unknown	Incident Number: 7273; Spill Source: Side Dump Tractor.	
12/19/04	Oily Water			Human Error	Unknown	Incident Number: 7391	
2/14/05	Chemical, Liquid			Equipment Failure	Unknown	Incident Number: 7630	
5/13/05	Glycol			Unknown	Unknown	Incident Number: 8078; Spill Source: 12" Recirculation Pipe From The Contingency Skid	
1/18/06	Diesel Fuel			Fuel line failure	Visual	Incident Number: 12953; Spill Source: Crew bus	Fuel Line Failure
1/9/07	Crude Oil			Loose valve on a 2" TORE fitting	Visual	Incident Number: 15235; Spill Source: RGV-32 Bypass line	Valve
5/16/07	Diesel Fuel			Diesel supply hose located on top of the tank ruptured	Visual	Incident Number 15502; Spill Source: Tank 110 diesel supply hose	Fuel Transfer

TABLE 2-10 (CONTINUED) ALYESKA PIPELINE SPILLS GREATER THAN 55 GALLONS JUNE 1977 THROUGH DECEMBER 2010 [18 AAC 75.425(e)(2)(B)(i) AND (ii)]

Date	Substance	Gallons	Location	Cause	Detection Method	Comments	
2/18/09	Crude Oil	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Fast loop pump failed	Visual	Incident Number: 16632; Spill Source: Kuparuk metering skid fast loop system	Equipment Failure
3/1/10	Diesel Fuel			Cracked fuel filter	Visual	Incident Number: 16640, Spill 5797; Spill Source: APSC Tractor Trailer #4305	Fuel Line Failure
5/25/10	Crude Oil			During testing of the fire system, a power failure occurred resulting in the tank relief valves opening as they are designed to do. Subsequently, Tank 190 overflowed into secondary containment.	Visual	Incident Number 17096, Spill 5859; Spill Source: Tank 190	Overflow
6/25/10	Diesel fuel			When pulling out of parking lot to Richardson hwy, the truck's fuel tanks contacted the asphalt and the driver's side tank developed a diesel leak. The passenger's side fuel tank was also found to be leaking from a fitting on the bottom of the tank.	Visual	Incident Number 17276, Spill 5888; Spill Source: Tractor #R6834	Vehicle Accident

2.2.1 Discharge Prevention Programs at Alyeska

In addition to the discharge prevention training programs outlined in Section 2.1, Alyeska has undertaken a number of other initiatives to prevent or mitigate oil spills [18 AAC 75.425(e)(2)(b)(iv)]. These initiatives have resulted in an overall reduction in the volume of oil products spilled and the annual number of spills events. *EN-43-007, Environmental Protection Manual: Spill Prevention, Reporting, and Cleanup,* contains information related to spill prevention and reduction programs, which are summarized here. Specific actions taken over time to prevent or mitigate the impacts of spills, listed by cause, are as follows:

Spills caused by equipment failure (stationary and mobile):

- Pre-construction design reviews for the purpose of spill prevention have resulted in design modification to reduce the potential of spills.
- Use of portable spill containment and installation of permanent spill containment under and around equipment has prevented spills from reaching the open environment.
- Spill incident investigations have resulted in changes to preventive maintenance procedures, equipment component changes, operating procedures, and system design modifications.

Spills caused by fuel line failure:

- System modifications to upgrade materials in both hard piping and hoses
- Modifications to operating procedures
- Modifications to preventive maintenance procedures

Spills caused by fuel transfer:

- Installation of overfill protection alarms and metering devices
- Prohibition of unattended loadings or other fuel transfers
- Increased frequency of preventive maintenance actions
- Installation of permanent secondary containment systems and use of portable containment systems

Spills caused by valve-related failures:

- Increased inspection frequency
- Increased preventive maintenance frequency

2.3 POTENTIAL DISCHARGE ANALYSIS [18 AAC 75.425(e)(2)(C)]

This section contains tables that show potential spill sources at each pump station. The predicted frequency and magnitude of hypothetical spills was studied and quantified in three separate studies commissioned by Alyeska between 1991 and 2001.

- *Trans-Alaska Pipeline System Risk Assessment*, Technica, Inc., January, 1991.
- *Risk Analysis Screening Study for the Trans-Alaska Pipeline System*, Taylor & Associates, May 1995.
- *Risk Assessment of the Trans Alaska Pipeline System*, Capstone Engineering Services Inc, November, 2001.

Each risk assessment assessed the likelihood of small, medium, and large spills along the pipeline, and at the pump stations and are discussed in Volume 1, Sections 2.3.1, 2.3.2, and 2.3.3.

In December 2003, the Alaska Department of Environmental Conservation (ADEC) granted conditional approval of Alyeska's strategic reconfiguration amendments to the pipeline oil spill contingency plan. In 2004, the Bureau of Land Management (BLM) also granted conditional approval of Alyeska's plan. As part of the conditions of approval, an update to the 2001 Capstone Risk Analysis was required (Attachment B, Section A.1 of BLM Letter No. 03-044-JS dated March 31, 2004 and Condition Number 2 of ADEC Letter dated December 31, 2003 for Plan No. 015-CP-4131).

The report findings are outlined in Volume 1, Section 2.3.4, "Det Norske Veritas Screening Risk Assessment." The full study was completed in May 2005.

- *Screening Risk Assessment: Report for Alyeska Pipeline Service Company*, Det Norske Veritas, May 2005.

In addition to the risk assessment update, the conditional approvals also required a fate and transport study (Attachment B, Section A.2, of BLM Letter No. 03-044-JS dated March 31, 2004 and Condition Number 2 of ADEC Letter dated December 31, 2003 for Plan No. 015-CP-4131).

The report findings are outlined in Volume 1, Section 2.3.4, "Det Norske Veritas Screening Risk Assessment." The full study was completed in May 2005.

- *Alyeska SR C-Plan Compliance Support Project Report*, Det Norske Veritas, May 2005.

In 2008/2009, Alyeska reperformed the potential spill volume calculations, fate and transport analyses, and risk assessment evaluations for TAPS per USDOT Integrity Management regulations (49 CFR 195.452). Methodologies established by the 2005 DNV studies were followed (Sections 2.34 and 2.35) and general discussion of the results are outlined in Section 2.3.6.

Volume 1, Section 2.3.8 discusses projections of future spill risks, and Volume 1, Section 2.3.8, discusses how Alyeska determines the response-planning standard (RPS) for a pipeline spill.

(b) (7)(F), (b) (3)

TABLE 2-11 POTENTIAL SPILL SOURCES, PUMP STATION 1

Type	Capacity	Type of Oil	Containment	Location/Purpose
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Dike	(b) (7)(F), (b) (3)
Storage tank		Crude oil	Dike	
Storage tank		Turbine fuel	Dike	
Storage tank		Gasoline	Dike	
Storage tank		Gasoline	Dike	
Storage tank		Diesel	Lined dike	
Storage tank		Used oil	Lined dike	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Sump		Lube oil	Building	
Drum		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Sump		NGL	Building	
Sump		Crude oil/lube oil	Building	
Sump		Crude oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Therminol	Building	
Reservoir		Lube oil	Building	
Reservoir		Hydraulic fluid	Building	
Reservoir		Hydraulic fluid	Building	
Sump		Crude oil	Building	
Reservoir		Hydraulic fluid	Building	
Expansion tank		Therminol	Building	
Storage tank		Diesel	Building	
Tank		Therminol	None 1	
Storage		Diesel	Lined dike	
DRA trucks		DRA	(2)	

TABLE 2-11 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 1

Type	Capacity	Type of Oil	Containment	Location/Purpose
Sump	(b) (7)(F), (b) (3)	Crude/lube oil	Building	(b) (7)(F), (b) (3)
Tank		Diesel	Lined dike	(b) (7)(F), (b) (3)

Notes:

1. *Tank is normally empty. It provides overflow relief for the Therminol system.*
2. *The drag reducing agent (DRA) containers are sturdy and the likelihood of damage is remote. Because of the high viscosity properties of DRA, spilled DRA would be effectively handled by pump station personnel; therefore, no secondary containment is necessary.*

TABLE 2-12 POTENTIAL SPILL SOURCES, PUMP STATION 3

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	Operational as relief tank at electrified, remotely controlled facility.
Storage tank		Turbine fuel	Lined dike		Out of service and empty.
Storage tank		Gasoline	Lined dike		Out of service and empty.
Storage tank		Gasoline	Lined dike		Out of service and empty.
Storage tank		Diesel	Building		In service.
Reservoir		Lube oil	Building		In service.
Reservoir		Lube oil	Building		In service.
Reservoir		Lube oil	Building		In service.
Reservoir		Lube oil	Building		In service.
Reservoir		Lube oil	Building		In service.
Storage tank		Hydraulic fluid	Building		In service.
Storage tank		Hydraulic fluid	Building		In service.
Storage tank		Used lube oil	Building		In service.
Reservoir		Hydraulic fluid	Building		Out of service.
Sump		Crude oil/lube oil	Building		In service.
Sump		Hydraulic fluid/crude oil	Building		In service.
Sump		Crude oil	Building		In service.
Sump (out-of-service)		Lube oil/turbine fuel	Building		Out of service.
Expansion tank		Therminol	Building		In service.
Drums		Lube oil	Building		In service.
Tank (blowdown)		Therminol	None *		In service.

TABLE 2-12 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 3

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Drums	(b) (7)(F), (b) (3)	Miscellaneous oily hazardous waste (fresh crude, gasoline)	Building (conex unit)	(b) (7)(F), (b) (3)	In service.
Storage tank		Diesel fuel	Lined dike		In service.
Tank		Used lube oil	Lined dike		In service.
Drums		Diesel fuel	None		In service.
Reservoir		Lube oil	Building		In service.
Storage building		Corrosion inhibitor	Building		In service.
Storage building		Hazardous waste storage	Building		In service.
Storage tank		Diesel fuel	Lined Dike		In service.

Note:

**Tank is normally empty. It provides overflow relief for the Therminol sys*

TABLE 2-13 POTENTIAL SPILL SOURCES, PUMP STATION 4

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	
Storage tank		Turbine fuel	Lined dike		Out of service and empty.
Storage tank		Gasoline	Lined dike		
Storage tank		Used oil	Steel dike		
Storage tank		Diesel	Lined dike		
Storage tank		JP-4	Lined dike		
Storage tank		Diesel	Lined dike		
Reservoir		Lube oil	Building		
Reservoir		Lube oil	Building		
Reservoir		Hydraulic fluid	Building		
Reservoir		Lube oil	Building		
Reservoir		Lube oil	Building		
Reservoir		Lube oil	Building		
Sump (disconnected but not removed)		Lube oil, methanol	Building		
Sump		Crude oil	Building		
Sump		Crude oil	Building		
Sump		Crude oil	Building		
Storage tank		Motor oil, antifreeze, auto transmission fluid 3	Building/self-contained		
Metal basin		Turbine fuel/solvent	Building		
Storage tank		Diesel	Building		
Expansion tank		Therminol	Building		
Drum		Used oil	Building		

TABLE 2-13 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 4

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Drum	(b) (7)(F), (b) (3)	Lube oil	Building	(b) (7)(F), (b) (3)	
Storage tank		DRA	Building		
Storage tank		DRA	Building		
Transport container		DRA	None[1]		
Tank		Therminol	None[2]		
Storage vessels		Corrosion inhibitor[3]	Containment at injection skid		
Hazardous Waste Conex		Fresh crude, gasoline	Conex unit		

Notes:

1. *There is no containment for the DRA delivery containers. Due to t DRA, containment of the delivery containers is not required.*
2. *Tank is normally empty. It provides overflow relief for the Therminol sy*
3. *Corrosion inhibitor is not an oil product covered by SPCC regulation of PS04. Likewise, some other products such as antifreeze are also not SPCC covered but are duct range within common storage areas.*

TABLE 2-14 POTENTIAL SPILL SOURCES, PUMP STATION 5

Type	Capacity	Type of Oil	Containment	Location/Purpose
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)
Storage tank		Turbine fuel	Lined dike	
Storage tank		Gasoline	Lined dike	
Storage tank		Used oil	Lined dike	
Storage tank		Diesel	Lined dike	
Storage tank		JP-4	Lined dike	
Expansion tank		Therminol	Building	
Sump		Crude oil	Building	
Sump		Crude oil/turbine fuel	Building	
Sump		Crude oil	Building	
Storage tank		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Lube oil	Building	
Reservoir		Hydraulic fluid	Building	
Storage tank		Diesel	Building	
Storage tank		Diesel	Lined dike	
Storage tank		Antifreeze	Building	
Drum		Lube oil, ATF, glycols, solvents	Building	
Drum		Lube oil	Building	
Tank		Therminol	None *	
Tank		Used oil	Building	

Note:
** Tank is normally empty. It provides overflow for the Therminol system.*

TABLE 2-15 POTENTIAL SPILL SOURCES, PUMP STATION 6

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	Out-of-service and empty
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Residuum	Lined dike		Out-of-service and empty
Storage tank		Diesel	Lined dike		In service
Storage tank		Diesel	Lined dike		In service
Storage tank		JP-4	Lined dike		In service
Storage tank		Diesel	Lined dike		In service
Storage tank		Diesel	Lined dike		Out-of-service and empty
Reservoir		Corrosion inhibitor	Building		In service
Reservoir		Corrosion inhibitor	Building		In service
Reservoir		Corrosion inhibitor	Building		In service
Reservoir		Corrosion inhibitor	Building		In service
Sump (blocked out)		None	Building		Out-of-service and empty
Sump		Turbine fuel/crude oil	Building		Out-of-service and empty
Sump		Crude oil	Building		Out-of-service and empty
Reservoir		Reflux	Building		Out-of-service and empty
Knockout pot		Reflux	Building		Out-of-service and empty
Storage tank		Diesel	Building		Out-of-service and empty
Expansion tank		Therminol	Building		In service
Reservoir		Hydraulic fluid	Building		In service
Sump		Crude oil	Building		Out-of-service and empty

TABLE 2-15 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 6

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Drum	(b) (7)(F), (b) (3)	Used oil	Building	(b) (7)(F), (b) (3)	In service
Drum		Reflux	(1)		Out-of-service and empty
Drum		Lube oil	Building		Out-of-service and empty
Tank		Therminol	None 2		Out-of-service and empty
Storage tank		Diesel	Lined dike		In service
Tank		Used oil	Building		Out-of-service and empty
Blowdown tank		Turbine fuel	None (2)		Out-of-service and empty
35 kW generator diesel tank		Diesel	None		In service
300 kW generator lube oil reservoir		Lube oil	Enclosure		In service
30 kW generator diesel day tank		Diesel	Enclosure		In service

Notes:

1. *This drum is contained within the flare stack.*
2. *Tank is normally empty. It provides overflow relief for the Thermi*

TABLE 2-16 POTENTIAL SPILL SOURCES, PUMP STATION 7

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	Operational as relief tank by manual operation.
Storage tank		Turbine fuel	Lined dike		
Storage tank		Turbine fuel	Lined dike		
Storage tank		Diesel	Lined dike		
Storage tank		Gasoline	Lined dike		
Storage tank		Diesel	Building		
Overpack drum		Lube oil, Therminol, glycol	Building		
Expansion tank		Therminol	Building		
Storage tank (vent receiver)		Turbine fuel	Buried		
Metal reservoir		Lube oil	Building		
Metal reservoir		Lube oil	Building		
Metal reservoir		Lube oil	Building		
Metal reservoir		Lube oil	Building		
Metal reservoir		Lube oil	Building		
Metal reservoir arctic pak		Lube oil	Generator housing unit		
Expansion tank		Natural gas liquids, crude oil	Building		
Storage tank		Lube oil	Building		
Blowdown tank		Therminol	None*		
Sump		Turbine fuel, crude oil	Buried, encased in concrete		
Drum		AFT	Building		

TABLE 2-16 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 7

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Diesel	Lined dike	(b) (7)(F), (b) (3)	

Note:
** Tank is normally empty. It provides overflow relief for the Ther m.*

TABLE 2-17 POTENTIAL SPILL SOURCES, PUMP STATION 8

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	Out-of-service and empty
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Turbine/Naphtha fuel	Lined dike		Out-of-service and empty
Storage tank[1]		Residuum	Lined dike		Out-of-service and empty
Storage tank		Diesel	Lined dike		Out-of-service and empty
Storage tank		Diesel	Lined dike		In service
Metal knockout drum[1]		Naphtha	None		Out-of-service and empty
Sump[1]		Naphtha, crude oil, turbine fuel	Buried, encased in concrete		Out-of-service and empty
Metal knockout drum[1]		Naphtha	Building		Out-of-service and empty
Metal drum[1]		Crude oil/turbine fuel	Building		Out-of-service and empty
Metal Knockout drum[1]		Naphtha	Building		Out-of-service and empty
Metal Drum[1]		Naphtha	Building		Out-of-service and empty
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Generator housing unit		Out-of-service but full
Reservoir		Hydraulic fluid	Building		Out-of-service and empty
Storage tank		Diesel	Building		Out-of-service and empty
Sump		Turbine fuel, crude oil	Buried		Out-of-service and empty
Sump		Turbine fuel/crude oil, Naphtha	Buried, encased in concrete		Out-of-service and empty
Reservoir		Therminol	Building		Out-of-service and empty

TABLE 2-17 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 8

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Metal blowdown tank	(b) (7)(F), (b) (3)	Therminol	None3	(b) (7)(F), (b) (3)	Out-of-service and empty

Notes:

1. *Not in service due to topping unit shut down.*
2. *The sump is used to drain the pump and turbine buildings and the manifold building. It is pumped into Tank 1.*
3. *The tank is normally empty. It provides overflow relief for the Therminol system.*

TABLE 2-18 POTENTIAL SPILL SOURCES, PUMP STATION 9

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank 190	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	
Storage tank 197		Turbine fuel	Lined dike		Out of service and empty.
Storage tank 198		Turbine fuel	Lined dike		Out of service and empty.
Storage tank		Diesel	Building		
Sump		Lube oil, crude oil, turbine fuel	Buried in floor		
Sump		Crude oil	Buried in floor		
Sump (out-of-service) (isolated)		Turbine fuel (normally empty)	Buried		
Reservoir		Lube oil	Building		
Reservoir		Lube oil	Building		
Reservoir		Lube oil	Building		
Reservoir		Hydraulic fluid	Building		
Sump		Turbine fuel, lube oil, crude oil	Buried in floor		
Expansion tank		Therminol	Building		
Reservoir		Lube oil	Building		
Drum		Lube oil	Building		
Blowdown tank		Therminol	None *		
Blowdown tank		Turbine fuel	None *		
Storage tank		Heating oil, Arctic diesel	Lined dike		
Hazmat conex		Therminol, hydraulic oil, crude, paint, lube oil	Building		
Corrosion inhibitor		Corrosion inhibitor	Building		

Note:
** These tanks are normally empty. They provide overflow relief for the The transfer area.*

TABLE 2-19 POTENTIAL SPILL SOURCES, PUMP STATION 10

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	Out-of-service and empty
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Residuum	Lined dike		Out-of-service and empty
Storage tank		Gasoline	Lined dike		Out-of-service and empty
Storage tank		Diesel	Lined dike		Out-of-service and empty
Storage tank		JP-4	Lined dike		Out-of-service and empty
Knockout drum		Naphtha	[1]		Out-of-service and empty
Knockout drum		Naphtha	Building		Out-of-service and empty
Drum		Crude oil	Building		Out-of-service and empty
Drum		Naphtha	Building		Out-of-service and empty
(Metal pot)		Naphtha	Building		Out-of-service and empty
(Sump)		Naphtha, crude oil, turbine fuel	Buried, encased in concrete		Out-of-service and empty
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Storage tank		Diesel	Building		Out-of-service and empty
Sump		Crude oil	Buried, encased in concrete		Out-of-service and empty
Expansion tank		Therminol	Building		Out-of-service and empty
Blowdown tank		Turbine fuel	None[2]		Out-of-service and empty
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Corrosion inhibitor	Building		Out-of-service but full
Reservoir		Hydraulic fluid	Building		Out-of-service and empty

TABLE 2-19 (CONTINUED) POTENTIAL SPILL SOURCES, PUMP STATION 10

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Sump	(b) (7)(F), (b) (3)	Crude oil	Buried, encased in concrete	(b) (7)(F), (b) (3)	Out-of-service and empty
Sump		Crude oil	Buried, encased in concrete		Out-of-service and empty
Sump		Turbine fuel	Buried		Out-of-service and empty
Process vessel		Naphtha	Lined dike		Out-of-service and empty
Storage tank		DRA	Building		Out-of-service and empty
Storage tank		Used oil	Building		Out-of-service and empty
Metal blowdown tank		Therminol	None[2]		Out-of-service and empty
Storage tank		Diesel	Lined dike		In service
Desalter		Crude oil	None		Out-of-service and empty

Notes:

1. *This drum is contained within the flare stack. The likelihood of h m is so remote that a containment mechanism is not required.*
2. *These tanks are normally empty. They provide overflow relief to the 22) and the Therminol system (Tank 33).*

TABLE 2-20 POTENTIAL SPILL SOURCES, GLENNALLEN RESPONSE BASE

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Diesel	Double-walled tank	(b) (7)(F), (b) (3)	Out-of-service and empty
Storage tank		Used oil	Steel secondary containment		
Storage tank		Diesel	Double-walled tank		

TABLE 2-21 POTENTIAL SPILL SOURCES, MP 735 (PS12)

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Storage tank	(b) (7)(F), (b) (3)	Crude oil	Lined dike	(b) (7)(F), (b) (3)	Operational as relief tank only in the event of an emergency cold restart event
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Turbine fuel	Lined dike		Out-of-service and empty
Storage tank		Diesel	Lined dike		Out-of-service and empty
Storage tank		Gasoline	Lined dike		Out-of-service and empty
Storage tank		JP-4	Double-walled tank with secondary containment		Out-of-service and empty
Sump		Turbine fuel, lube oil, crude oil	Buried		Out-of-service and empty
Sump		Turbine fuel, crude oil, lube oil, waste oil	Buried encased in concrete		Out-of-service and empty
Reservoir		Lube fuel	Building		Out-of-service and empty
Reservoir		Lube oil	Building		Out-of-service and empty
Reservoir		Lube oil	Building		Out-of-service and empty
Reservoir		Lube oil	Building		Out-of-service and empty
Storage tank		Used oil	Building		Out-of-service and empty
Expansion tank		Therminol	Building		Out-of-service and empty
Reservoir		Hydraulic fluid, lube oil, antifreeze, and methanol	Building		Out-of-service and empty
Blowdown tank		Turbine fuel	None		Out-of-service and empty
Blowdown tank		Therminol	None		Out-of-service and empty
Drum		Lube oil, antifreeze, methanol, hydraulic fluid	Building		Out-of-service and empty

TABLE 2-21 (CONTINUED) POTENTIAL SPILL SOURCES, MP 735 (PS12)

Type	Capacity	Type of Oil	Containment	Location/Purpose	Status
Drum	(b) (7)(F), (b) (3)	Lube oil	Building	(b) (7)(F), (b) (3)	Out-of-service and empty
Storage tank		Diesel	Building		Out-of-service and empty
Sump		Crude oil	Buried, encased in concrete		Out-of-service and empty
Sump		Crude oil	Buried, encased in concrete		Out-of-service and empty
Storage tank		Diesel	None		Out-of-service and empty
Storage tank		Diesel	None		Out-of-service and empty
Storage Tank		Heating oil	Lined dike		Out-of-service and empty
Hazmat conex		Therminol, crude/consul, paint, lube oil, hydraulic oil	Building		Out-of-service and empty
Corrosion Inhibitor Conex		Corrosion inhibitor	Building		Out-of-service and empty
Tank skid		JP-4	None - mobile fueling vessel		Out-of-service and empty

2.3.1 Technica Inc. Risk Assessment

In 1990, a comprehensive risk assessment study to determine the probabilities of potential crude oil spills along the trans-Alaska pipeline was performed. The objective was to estimate the frequency and the size of realistic maximum potential oil spills along the trans-Alaska pipeline from the (b) (7)(F) inlet at Prudhoe Bay to the East Metering Building at Valdez.

The study was performed by a consulting firm, Technica, Inc., and an independent consulting group subjected their final detailed report to a critical peer review from the University of Illinois headed by Dr. W. J. Hall. The comments of this peer review have been incorporated in Technica's final report.

To achieve the objective of the assessment, Technica first reviewed the TAPS design basis, specifications, drawings, etc., to understand the system. Then they identified potential oil spill initiators/hazards through two methods. One was the examination of the TAPS incident history, and the other was a review of the TAPS design and operation using the Hazard and Operating (HAZOP) study technique. This investigation also provided information on conditions or failures that may delay the detection and isolation of a leak.

The HAZOP study is a formal and critical investigation of the system. Each system component is evaluated as to what would happen if the conditions in the system were to deviate from the design basis or operating procedures. For instance, the study evaluated what would happen if a safety device did not work, if a critical slope where the pipe is buried washed out, or if an underground section of the pipe settled due to thawing, etc. The study involved experts from Technica asking leading questions to various Alyeska groups (Engineering, Operations, Maintenance, Security, etc.) in many organized sessions. Those conditions that would potentially result in oil spills were identified as initiators for further analysis to determine spill frequencies and magnitudes.

The realistic maximum oil spill was determined by postulating realistic scenarios occurring at the worst location from a spill volume perspective. Conservative estimates of equipment failure rates and human error probabilities were used to quantify the frequencies of the postulated scenarios.

For the study, Technica divided the pipeline into 11 sections consistent with Alyeska's *Oil Spill Contingency Plan - Pipeline* (Apri1 1993 version). There was one exception (b) (7)(F), (b) (3) was considered as one section, whereas it is two in Alyeska's Plan (b) (7)(F), (b) (3)). Each section covered the stretch of pipeline between adjoining pump stations (Section 1 between PS01 and (b) (7), Section 2 between (b) (7)(F), (b) (3) Technica developed frequency (or recurrence period) versus realistic maximum potential oil spills for each section by applying the risk assessment to a "worse" location within that section; the location where a break would result in the highest potential spill quantity. Therefore, Technica's worst-case results for each section were conservatively utilized throughout for each "Contingency Area" and "Segment" within that section.

2.3.2 Taylor & Associates Risk Assessment

J. R. Taylor Associates ApS conducted a quantitative risk assessment of Alyeska's crude and gas handling facilities in 1995. The purpose of the risk assessment was to screen all Alyeska operations to identify the sources of greatest risk to workers and the most likely contributors to oil spills. For the

purposes of this discussion, the Valdez Marine Terminal has been excluded. The focus is on pipeline operations and, specifically, on oil spill contributors.

The methodology employed was to apply historical oil industry data on similar equipment configurations to predict spill frequencies and the most likely contributors to these events. In some cases, the historical frequency data was modified to make it more Alyeska-specific by utilizing checklists of such modifiers and by input received during on-site inspection of representative samples of all facilities covered by the study. For a given equipment system (such as a pump station), the accident/spill frequencies for all equipment types involved (pumps, storage tanks, pressure vessels, etc.) were summed to give the risks for that equipment system. Additionally, the pipeline itself (between pump stations) was also assessed. Oil spill risks are presented for each section of the pipeline and for the pump stations.

The most likely causes of leaks were identified as unplanned RGV closures, excavation work near the line, ground settlement, and truck crashes.

It is important to note that since completion of this risk assessment, four pump stations (b) (7)(F), (b) (3) [redacted]) and three topping units have been shut down.

2.3.3 Capstone Screening Risk Analysis

Because of the many changes in pipeline operations and conditions, as well the availability of improved technology for risk assessment, Capstone Engineering Services Inc. carried out an updated analysis of pipeline spill risks. The study analyzed the risk of spills from the pipeline and valves and also spills in the pump stations. It excluded leaks in the fuel loading/unloading area and other vehicle leaks (accidents, etc.).

The Capstone Risk Analysis provided screening-level results on a mile-by-mile basis. For each mile, worst-case conditions were applied to represent the entire mile, even though the conditions may only apply for a few hundred feet or less. This tended to overstate the risk for some locations, but it also drew attention to potential trouble spots along the line. In addition, this risk assessment combined the risks from all hazards at each mile, and thus is generalized. Risk management should be applied to specific rather than general risks. For locations that were flagged as being a high risk by this study, a more detailed risk assessment — focusing on a single cause or risk factor — may be required to determine if mitigation is appropriate.

2.3.3.1 Approach and Methodology

The Capstone study, conducted in November 2001, analyzed TAPS on a mile-by-mile basis. This approach allowed the risk analyst to provide a more realistic picture of risk, rather than rely on a dozen or more “worst-case” locations along the pipeline. This risk analysis was built on the previous two risk assessments described above. Key considerations in the Capstone Screening Risk Analysis were as follows:

- The pipeline was divided into mile-long sections. The probability of a leak and the resulting spill volume were estimated for each mile.
- The worst case conditions for a joint (about 40-60 feet in length) were typically applied to a mile-long segment.

- Expert judgment was used in places where good data were not available.
- Only spills with a volume greater than 50 bbls were considered in this study.
- For each mile of pipe, separate scenarios were evaluated, with varying hole sizes, and with varying leak detection times.
- It was assumed that all TAPS maintenance and surveillance programs that are currently in place would remain in place for the foreseeable future, and that these programs would continue to help prevent leaks from occurring.
- The leak history for TAPS (startup through October 2001) and other pipeline industry historical data were used to help establish the chances of a leak.
- Over 25 factors were analyzed to assess the frequency of a leak, including the following: internal inspection data, as analyzed by corrosion experts; age of the pipe; placement of pipe (above ground vs. below ground); pipe wall thickness and strength; susceptibility to excavation damage; vulnerability of aboveground sections to sabotage; the potential for pressure surges (hydraulic events); proximity of the pipe to people (third parties) and vehicle traffic.
- Alyeska seismic experts provided the basis for a seismic leak-prediction model.
- Spill volumes were reported as general ranges of spill sizes. Spill volume calculations accounted for pressure, static head, and reasonable mitigation measures.

The Capstone Risk Analysis also accounted for recent changes in pipeline operations, such as the decommissioning of pump stations and topping units, as well as the reduced flow rates in the pipeline.

2.3.3.2 Results of Capstone Screening Risk Analysis

The results of the likelihood analysis (Table 2-22) show that a spill of 50 barrels or greater will occur once every 2.8 years on the pipeline. The dominant causes of leaks are sabotage, corrosion, errors by maintenance crews and hydraulic events. Leaks caused by maintenance crews include maintenance trucks striking the line, errors in valve maintenance, and other mishaps.

The estimated frequency of once in 2.8 years means that the Capstone model predicted that 9 total spills would have occurred over the past 25 years. In actuality, there have been 8 spills (greater than 50 barrels) in the 25 years of TAPS operation.

The highest risk scenarios for the pipeline are the small holes (0.1-inch diameter) that are undetected for a long period of time, and the 1-inch holes that occur in a location that is difficult to access and has a large drain volume. Neither of these scenarios produces spill volumes greater than 15-20,000 barrels, but they are of high risk because of their relatively high likelihood of occurrence. The full-bore rupture of the pipeline may produce a large spill volume; however, its risk is relatively low because it is a very rare event.

TABLE 2-22 ESTIMATES OF LIKELIHOOD OF SPILLS GREATER THAN 50 BARRELS, BY CAUSE

Cause	Frequency of Leak (per year)	Percent Contribution	Recurrence Period
Sabotage	0.10	29%	10 years
Corrosion	0.08	22%	12 years
Maintenance	0.04	11%	24 years
Hydraulic Events	0.032	9.0%	31 years
Mechanical Defect	0.030	8.4%	33 years
Washout	0.026	7.3%	38 years
Flange and Seal Leaks	0.016	4.4%	63 years
Settlement	0.015	4.2%	67 years
Seismic Event	0.012	3.4%	83 years
Excavation Damage	0.006	1.7%	167 years
Vehicle Impact	0.001	0.3%	1,000 years
Aircraft Impact	5.9×10^{-5}	0%	20,000 years
Total Pipeline	0.36	100%	2.8 years

The results of the spill volume risk analysis are shown in Figure 2-4. This shows the actual experience of Alyeska along with the results predicted by the Capstone Screening Risk Analysis.

The results show that the predicted risk is slightly higher than the risk shown by historical data. Within the uncertainty bounds for this analysis, the predicted level of risk for TAPS is about the same as in the past. Two competing factors tend to balance each other to produce a constant level of risk. As the pipe ages risk goes up, but as TAPS matures, the surveillance and management of the pipeline are constantly improving. The net effect is a relatively constant level of risk over time, and even some risk reduction. Future projections are that TAPS will continue to experience about one leak every three years, a rate still well below the U.S. average.

The results shown in Figure 2-4 are consistent with the historical spill data for the pipeline. Of the eight pipeline spills reported for TAPS, one has fallen in the small volume category, as defined in this study, one in the medium volume category, five have fallen into the large volume category, and one in the very large volume category.

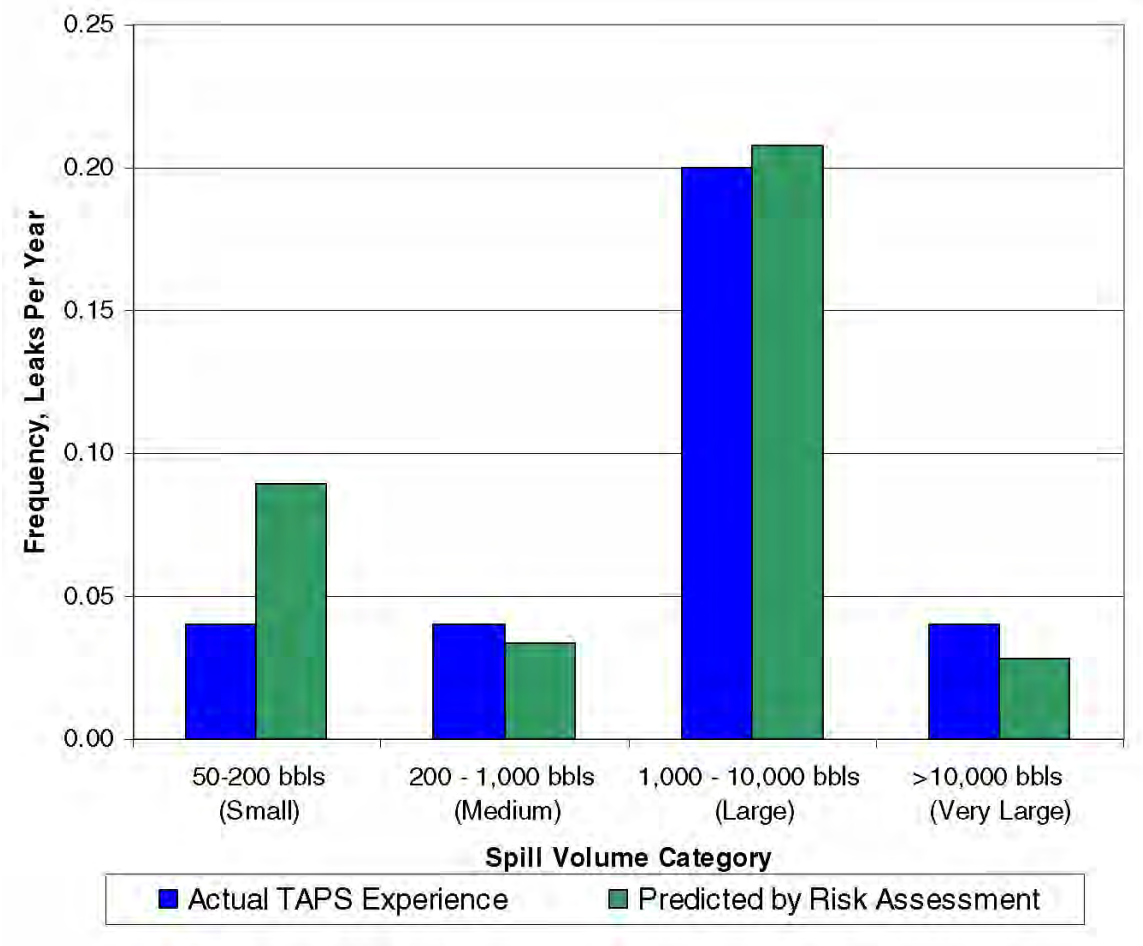


FIGURE 2-4 FREQUENCY OF LEAKS BY SPILL VOLUME CATEGORY

The frequency and size of leaks occurring at the pump stations were also analyzed in this risk assessment. Table 2-23 shows the percentage of predicted leaks due to various causes. Note that all leaks occurring at tanks are contained within a protective liner.

The predicted causes of most pump station leaks are tank bottom leaks, tank valve leaks, maintenance errors, and buried piping leaks. Tank bottom leaks dominate with 40% of the spills. It is projected that tank valve leaks, maintenance errors, and buried piping leaks would each contribute 18% of the spills at the pump stations. Table 2-23 ranks the pump station leak frequency by cause.

TABLE 2-23 PUMP STATION LEAK FREQUENCY BY CAUSE

Rank	Cause	Percent Contribution	Frequency (per year)
1	Tank Bottom	40%	6.1×10^{-2}
2	Tank Valve	18%	2.8×10^{-2}
3	Maintenance	18%	2.8×10^{-2}
4	Buried Piping	18%	2.7×10^{-2}
5	Crude Tank Overfills	4.7%	7.2×10^{-3}
6	Pump Leaks	0.4%	6.0×10^{-4}
7	Turbine Tank Overfills	0.2%	2.6×10^{-4}
8	Tank Shell Ruptures	0.1%	1.7×10^{-4}

2.3.4 Det Norske Veritas Screening Risk Assessment

Per the 2003 ADEC and 2004 BLM conditions of approval of the strategic reconfiguration (SR) amendments to this plan (see Volume 1, Section 2.3), Alyeska commissioned an update assessment to the 1991 Capstone Risk Analysis. The assessment, conducted by Det Norske Veritas (USA) Inc., addressed the following requirements:

- Perform the analysis of the complete pipeline using a methodology that is consistent with that of Section 3.3.3.1 of the amended C-Plan of December 31, 2003.
- Consider in the analysis all changes to TAPS maintenance programs as well as their implementation that have occurred since the C-Plan was approved.
- Consider in the analysis all changes to TAPS surveillance programs as well as their implementation that have occurred since the C-Plan was approved.

Established in 1864 and headquartered in Oslo (Høvik), Norway, Det Norske Veritas (DNV) is an independent international foundation with no shareholders, operating in approximately 300 offices in 100 countries. As a leading international provider of services for managing risk, DNV's objective is to safeguard life, property, and the environment. DNV operates internationally in multiple industries with a strong market presence in the oil & gas, maritime, process, and transportation industries. DNV's unique commitment to global outlook and independent corporate structure ensures a balanced approach to assessing the interests of industry, regulators, and stakeholders.

2.3.4.1 Approach and Methodology

Segmentation

The DNV assessment provided screening level results on a segment-by-segment basis, which differed from the Capstone mile-by-mile assessment. The segment approach used changes in risk parameters to determine segmentation. The Capstone mile-by-mile approach divided the pipeline into mile segments regardless of changes in risk parameters. For validation, a baseline scenario was developed that extracted the appropriate values from the Capstone study and applied them to the DNV assessment segments. In addition, both pre- and post-SR scenarios were developed.

The DNV assessment analyzed 1307 pipeline segments. The pipeline was then characterized using a set of parameters. Each segment in the analysis represents a portion of pipe over which none of the parameters changed.

Leak Frequency Analysis

For the pipeline leak frequency analysis, DNV determined that no additional causes needed to be added to the risk analysis model from the Capstone analysis. To assess leak frequency, consideration was given to the annual frequency per length of pipe that an event would occur, and the likelihood that, if a leak occurred, it would result in a hole of a particular size. Pipeline aging was also considered in the frequency assessment. This includes the physical condition of the pipe as well as improved knowledge of failure mechanisms and improved monitoring and surveillance systems.

Response Leak Case

Using historical data, predictive models, and expert opinions, a "response leak case" was developed for each segment of the pipeline based on likelihood, maximum leak rate, and total leak volume.

Methodology Comparison

Table 2-24 is a comparison of screening risk assessment (SRA) methodology of the 2001 Capstone assessment and the 2005 DNV approach.

TABLE 2-24 SRA METHODOLOGY COMPARISON

SRA 2001: General	SRA 2005: General
The SRA 2001 study, conducted in November 2001, analyzed TAPS on a mile-by-mile basis. This approach allowed the risk analyst to provide a more realistic picture of risk, rather than rely on a dozen or more "worst-case" locations along the pipeline.	The SRA 2005 study combines the best of the SRA 2001 and the "worst case analysis" method. Instead of a strictly mile-by-mile approach resulting in approximately 800 segments considered, the SRA 2005 generates segments based on the changes along the pipeline. This resulted in 1,307 segments of varying lengths over the 800 mile pipeline.
The SRA 2001 Risk Analysis accounted for recent changes in pipeline operations, such as the decommissioning of pump stations and topping units, as well as the reduced flow rates in the pipeline.	The DNV study considers the same issues as well as current and proposed changes in the maintenance and surveillance programs since 2002.

Table 2-25 compares the key considerations of the two studies.

TABLE 2-25 SRA CONSIDERATIONS COMPARISON

SRA 2001: Key Considerations	SRA 2005: Key Considerations
The pipeline was divided into mile-long sections. The probability of a leak and the resulting spill volume were estimated for each mile.	The DNV study performs the analysis on a segment-by-segment basis, one segment being defined as a part of the pipeline where the risk input parameters can be assumed to be constant.
The worst case conditions for a joint (about 40 to 60 feet in length) were typically applied to a mile-long segment.	
Expert judgment was used in places where good data were not available.	Expert judgment was used in places where good data were not available.
Only spills with a volume greater than 50 barrels were considered in this study.	Only spills with a volume greater than 50 barrels were considered in this study.
For each mile of pipe, separate scenarios were evaluated, with varying hole sizes, and with varying leak detection times.	For each segment of pipe, separate scenarios were evaluated, with varying hole sizes, and with varying leak detection times.
It was assumed that all TAPS maintenance and surveillance programs that are currently in place would remain in place for the foreseeable future, and that these programs would continue to help prevent leaks from occurring	It was assumed that all TAPS maintenance and surveillance programs that are currently proposed by the SR would remain in place for the foreseeable future, and that these programs would continue to help prevent leaks from occurring
The leak history for TAPS (startup through October 2001) and other pipeline industry historical data were used to help establish the chances of a leak.	The updated leak history for TAPS (startup through December 2004) and other pipeline industry historical data were used to help establish the chances of a leak.
Over 25 factors were analyzed to assess the frequency of a leak, including the following: internal inspection data, as analyzed by corrosion experts; age of the pipe; placement of pipe (above ground vs. below ground); pipe wall thickness and strength; susceptibility to excavation damage; vulnerability of above-ground sections to sabotage; the potential for pressure surges (hydraulic events); proximity of the pipe to people (third parties) and vehicle traffic.	The previous risk analyses considered over 25 possible factors influencing pipeline spills and from these identified 12 distinct causes applicable to TAPS. These 12 causes were re-considered with respect to the pipeline operations and changes in the maintenance and surveillance programs. • mechanical defects • vehicle impacts • excavation activity • corrosion • sabotage • earthquake or seismic activity • hydraulic events • flange joints along the pipeline • maintenance activities upon the pipeline • settlement of the soil around the pipeline • exposure to washout events • aircraft impact
Alyeska seismic experts provided the basis for a seismic leak-prediction model.	Alyeska seismic experts provided the basis for a seismic leak-prediction model.
Spill volumes were reported as general ranges of spill sizes. Spill volume calculations accounted for pressure, static head, and reasonable mitigation measures. Static volume calculation was based on an elevation profile of 2,712 points.	Spill volumes were reported as general ranges of spill sizes. Spill volume calculations accounted for pressure, static head, and reasonable mitigation measures. Static volume calculation was based on an elevation profile of 107,500 points.

2.3.4.2 Results of Det Norske Veritas Risk Assessment

Spill Quantities — Pipeline Leak Events

There have been eight pipeline leaks greater than 50 barrels since pipeline startup in 1977. None of the leaks occurred since the Capstone analysis.

Pipeline Leak Frequencies

Changes in pipeline leak frequencies from the Capstone study are summarized in Table 2-26.

TABLE 2-26 SUMMARY OF CHANGES FROM CAPSTONE ANALYSIS - PIPELINE LEAK FREQUENCIES

Element	Base Frequency	Modifying Factor	Hole Size Distribution			Reason for Change(s)
	Change	Change	Small	Medium	Large	
Mechanical Defects	Decrease	None	↓	↑	↑	Capstone considers pre-1970 construction methods; hole size distributions were corrected
Excavation Damage	None	Depth of Cover factor increased	↓	↑	↑	Correction of Capstone hole size distributions for depth of cover and additional wall thickness
Corrosion	Decrease	Most factors changed	↔	↔	↔	DNV review of corrosion data and existing conditions
Sabotage	Decrease	None	↔	↔	↔	Additional years of operating history without incident
Seismic	None	None	↓	↑	↓	Correction of hole size distributions
Hydraulic Events	None	Decrease	↔	↔	↔	DNV recalculation of results
Maintenance Damage	Decrease	None	↔	↔	↔	Additional years of operating history without incident
Settlement Events	Decrease	None	↔	↔	↔	Additional years of operating history without incident
Washout Events	None	None	↓	↑	↑	Correction of hole size distributions

DNV Relative to Capstone Analysis Legend: ↓Decrease ↑Increase ↔Unchanged

Spill Quantities — Pump Station Leak Events

Pump station spills have been small and infrequent. From 1977 to 2002, there were 276 pump stations incidents. Of these, only four events resulted in 50 barrels or more spilled and none occurred since the Capstone study.

Pump Station Leak Frequencies

For pre-strategic reconfiguration (pre-SR) conditions, DNV determined that the tank shell failure leak frequency and maintenance leak frequencies at the pump stations should be reduced from the values calculated by Capstone. In addition to the Capstone analysis of routine pump failures, DNV also analyzed catastrophic pump failure frequencies.

When considering the effects of SR, the cumulative pump station leak frequencies have been further reduced by 9.4×10^{-3} because post-SR, there are fewer pumps and tanks and less buried pipe in service at three of the pump stations.

Estimation of Spill Volumes

Spill volumes were calculated by factoring in detection time, isolation time, hole size, and isolated section volumes.

Pre-SR Overall likelihood of Leaks

The likelihood of a leak greater than 50 barrels anywhere along the pipeline is estimated to be about 0.26 per year, or once every four years. The actual TAPS experience through 2004 is a rate of 0.285 per year, or once every 3.5 years. Leak frequency by cause is listed in Table 2-27.

TABLE 2-27 PREDICTED PIPELINE LEAK FREQUENCY BY CAUSE

Cause	Percent Contribution	Frequency per year
Sabotage	37.9%	9.7×10^{-2}
Maintenance	14.3%	3.7×10^{-2}
Hydraulic Event	12.5%	3.2×10^{-2}
Flanges	11.0%	2.8×10^{-2}
Mechanical Defect	5.9%	1.5×10^{-2}
Settlement Event	5.7%	1.5×10^{-2}
Seismic	4.7%	1.2×10^{-2}
Excavation	2.7%	6.9×10^{-3}
Corrosion	2.7%	6.9×10^{-3}
Washout	2.6%	6.7×10^{-3}
Aircraft Impact	0.0%	5.6×10^{-5}
Vehicle Impact	0.0%	1.6×10^{-5}

Pre-SR Spill Volume Frequencies

Figure 2-5 compares the DNV analysis, the Capstone analysis, and actual TAPS experience of frequency of spill volumes.

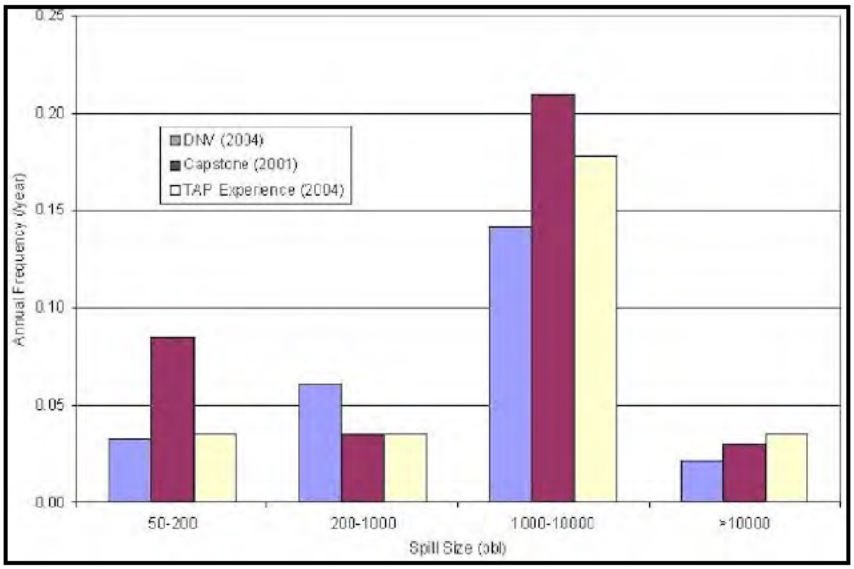


FIGURE 2-5 SPILL VOLUME FREQUENCY BY CATEGORY

Impact of Strategic Reconfiguration

Strategic Reconfiguration (SR) will affect four areas related to the spill volume frequency calculations.

1. Pump station spill frequency will be reduced.
2. Pipeline isolatable inventory will increase.
3. Pipeline operating pressures will change depending on the segment.
4. Valve closure times will increase.

Conclusion

Overall Likelihood of Leaks

SR will decrease the overall likelihood of a leak at a pump station facility. The overall likelihood of a pipeline leak remains constant as a result of SR.

Leak Frequency by Segment and Milepost

The Capstone analysis considered corrosion as the principal cause of leaks along the pipeline. As a result of DNV's re-analysis and consideration of the effective use of intelligent pigging and cathodic

protection by Alyeska, corrosion is no longer a leading factor in pipeline leaks. Instead, sabotage followed by hydraulic events and maintenance errors now dominate as the major causes of leaks.

Spill Volumes

Although the leak frequencies have been decreased as mentioned above, should a leak occur, the potential spill volumes would be larger for most of the length of the pipeline. This is a result of valve timing increases, changes in pressures, and changes in isolatable sections from those considered in the pre-SR Capstone analysis.

Table 2-28 summarizes sections of the pipeline where potential spill volumes are increased, and where they are decreased.

TABLE 2-28 POTENTIAL SPILL VOLUME CHANGES

Description	Increase/Decrease in Spill Volume	Milepost Range	Principal Driver of Increased Volumes
92 mile section south of PS05	Increase	(b) (7)(F), (b) (3)	Valve Timing changes
238 mile section between PS06 and PS09	Increase		Changes in Valve Timings and Isolatable Sections
148 mile section between PS10 and Valdez	Increase		(b) (7)(F), (b) (3)
14 mile section between PS04 and PS05	Decrease		Change in Valve Timing
130 mile section between PS09 and PS11	Decrease		Change in Valve Timing

Summary

DNV considered the methodology used in the update to be consistent with or superior to that used in the original Capstone analysis.

DNV considered the changes in TAPS maintenance programs and implementation as relayed to it by Alyeska pipeline officials.

A DNV analysis of SR shows that SR has no effect on the frequency of pipeline surveillance activities. Current practice for surveillance along the pipeline is for the maintenance crews to regularly check the pipeline using a written checklist. Security forces routinely fly the entire length of the pipeline. In addition, detailed annual pipeline walks inspect the integrity of the exterior of the pipeline.

As a result of DNV's re-analysis of the data and consideration of the effects of strategic reconfiguration, DNV stated that while the frequency of leaks is reduced, the spills, when they occur, result in more volume of oil released when compared with the pre-SR, Capstone analysis.

2.3.5 Det Norske Veritas Fate and Transport Analysis

Per the 2003 ADEC and 2004 BLM conditions of approval of the SR amendments to this plan, Alyeska commissioned a Fate and Transport (F&T) analysis assessing the change in environmental risk of an oil spill due to SR. This assessment was conducted by DNV (see Volume 1, Section 2.3.4).

2.3.5.1 Approach and Methodology

Objective

The goal of the F&T analysis was to ensure that appropriate mitigation measures were identified so that SR would not unacceptably increase TAPS environmental risk. Spill response time and estimated quantity spilled were key contributing factors in the analysis. The level of fate and transport analysis required for a particular segment varied depending on whether SR had impact on that segment, the resulting change in environmental risk to a receptor, and the insight needed to assess options for further mitigation. An overview of DNV's approach to assess the risk of environmental effects from pipeline spills is depicted in Figure 2-6.

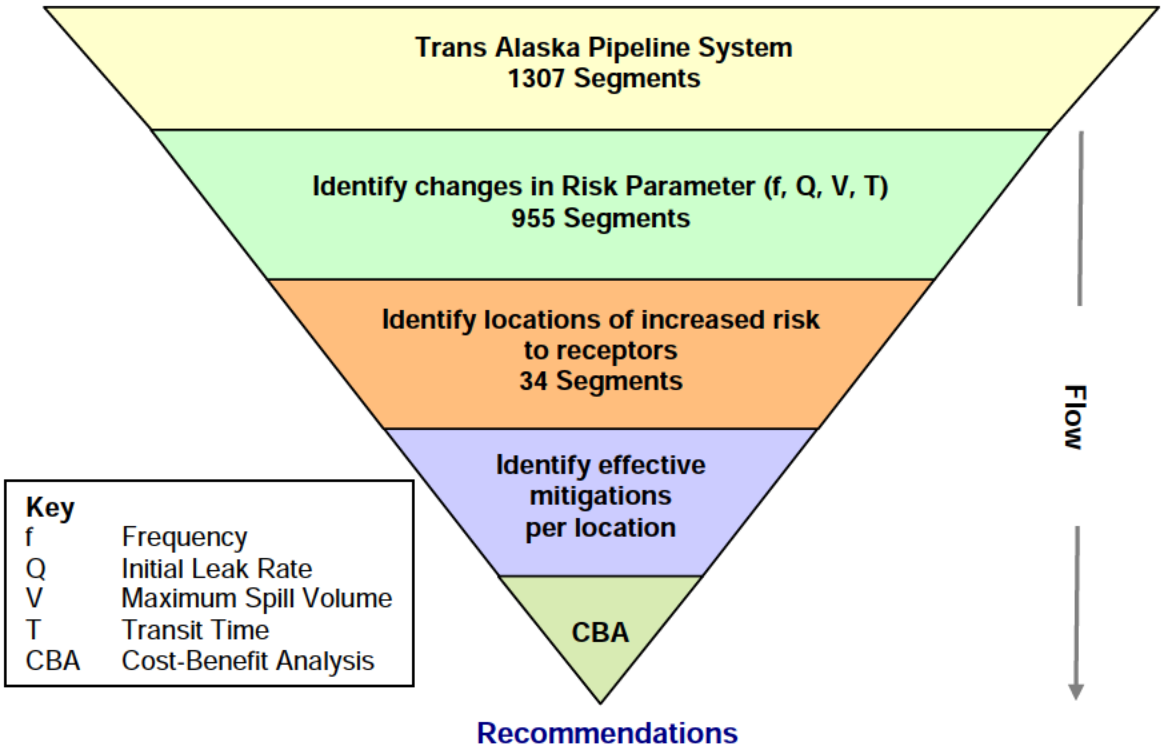


FIGURE 2-6 PROCESS FLOW FOR C-PLAN UPDATE COMPLIANCE SUPPORT

The Screening Risk Analysis (SRA) (DNV, 2005a) was completed prior to the F&T analysis. It identified portions of the pipeline with identical spill outflow characteristics concerning frequency (f), pressure (related to initial leak rate, Q), and maximum spill volume (V). These three parameters, together with an estimate of the time required for all required personnel and equipment to arrive at a designated response location (T), were used as risk change indicator parameters. They indicated where the pipeline risk might have increased, but did not definitively determine if the risk to any receptor was increased.

The list of segments showing increase in at least one risk parameter was then assessed to determine if there was a real increase in risk to receptors. Both a screening-level fate and transport model and a proprietary commercial fate and transport model were used to determine changes in receptor risk. Those segments showing an increase to the receptors were evaluated to identify all effective spill response mitigations.

Change Assessment

A practical objective of the F&T analysis was to identify changes in environmental spill risk from SR and develop a list of recommended mitigations to reduce any increase, at least back to the pre-SR level – a risk neutral level.

An initial step was to establish the definition of “SR changes.” Externally, all proposed changes were characterized as being part of Strategic Reconfiguration, although internally within Alyeska, the Strategic Reconfiguration Project had a very specific and limited scope. A number of the proposed changes occurred independently of the Strategic Reconfiguration project.

However, the scope of the F&T analysis was to consider all changes (not just those classified as being part of the Strategic Reconfiguration Project) and a primary input to the assessment is thus a list of the changes to be considered. The list of SR changes was an input to the SRA and to the F&T analysis.

One conclusion of the SRA was that SR would not increase pipeline spill frequency. As a result, the only spill risk parameters that could change spill risk will be those affecting consequence. To ensure that all risk changes from SR were identified, DNV utilized risk change indicator parameters, which identified where risk may have changed. An additional requirement concerned uncertainty: where uncertainty exists, the indication must always err on the side of indicating a risk change (where there may be none).

Beginning from first principles, the environmental consequence of a spill can only be altered by changes in:

- Spill release rate (Q) and volume (V) - Data concerning spill release rates and release volumes for Pre-SR and Post-SR were developed as part of the SRA (DNV, 2005).
- Ability to respond effectively (T_t) - A Transit Time Model was developed to evaluate spill response capability for guillotine failures (Baker, 2005). This model calculates the time required for all the required personnel and equipment to arrive at a specified response site.

The above measurable data, Q, V, and T_t, were used as indicator parameters; that is, a change in one of these might indicate a change in spill risk. However, the presence of change in indicator parameters does not necessarily mean an ultimate change in spill risk. Lack of change in indicator parameters can be interpreted to mean that a segment of the pipeline remains unchanged regarding spill risk.

Response Capability Evaluation

An effective spill response requires that the necessary personnel and equipment arrive in time and deploy effective mitigation measures to contain a spill. Total Effective Response Time is intrinsically linked to necessary personnel and equipment. The time necessary to implement an effective response incorporates the requirement for appropriate personnel and equipment. As a result, Total Effective Response Time is an indicator of change in risk. Total Effective Response Time consists of the overlap of several different measurable times:

1. Time for the pipeline systems to detect a spill
2. Time for a response action to be decided and initiated
3. Time for responders to assemble and prepare for departure
4. Transit time to the site
5. Deployment time for specific tactics
6. Time to control the leak

Some of the above times overlap, for instance, workers may begin deploying boom (5) while more response personnel continue to arrive (4). This study focuses on change, and SR adversely affected only items (3) and (4) for a guillotine failure, because it modified the number/locations of response personnel and equipment. SR did not change the time to detect or decide a response action for a guillotine failure. The extent of response-related changes from SR was determined by calculating and comparing the time between response initiation and tactical deployment. For purposes of simplification, it was assumed that no tactical deployment occurs until all personnel and equipment arrives.

2.3.5.2 Results of DNV F&T Analysis

Segments with Indicated Risk Change

Of the 1,307 segments of pipeline, each having unique spill risk characteristics, 955 (73%) were identified in this initial exercise to have potentially increased spill consequence (and risk). The 955 segments represent 601.1 miles of the pipeline. It is important to note that no credit was taken for offsetting decreases in indicator parameters. If the volume increased but the transit time decreased, the segment was labeled as one with indicated change.

The 955 change-indicated segments were moved forward for further review to determine the extent, if any, of the risk increase to a potential receptor.

To facilitate identifying those segments that had an increased spill consequence and thus required mitigation, eight risk cases were developed.

Each of the 955 segments fit into one of the eight cases. Cases 1 through 5 do not pose significant increase in receptor risk, and therefore do not require evaluation of additional mitigation measures. Cases 6, 7, and 8 require mitigation to reduce the receptor risk back to neutral.

To assist in categorizing the 955 segments into one of the above eight cases, a screening-level fate and transport model (Screening Level Model) was developed. The screening process preliminarily identified which case each segment belonged in. In practical terms, a hypothetical worst-case spill was modeled for each segment to identify the relevant case.

Segments identified using the Screening Level Model to have potential increased receptor risk were modeled by Applied Science Associates, Inc. (ASA) to verify the results.

TABLE 2-29 RISK EVALUATION CASE DEFINITIONS

Risk Evaluation Case		Description
1	SR results in reduction in risk	Risk improved because of SR, due to: 1) Post-SR, the spill is contained upstream of the Pre-SR spill, or 2) The maximum spill volume is less than the Pre-SR volume.
2	Oil spill restricted to land, with no change to sensitive resources impact	The Post-SR spill remains on land as it does Pre-SR, with no change in impacts to sensitive resources.
3	No Primary Containment Site (CS)* exists along oil trajectory	Either: 1) There is no pre-defined CS along the spill trajectory, or 2) The response time (Pre- and Post-SR) does not allow a team to deploy tactics at a pre-defined CS before the oil reaches it.
4	Primary CS does not change and release volume does not increase	The primary CS Post-SR is the same as Pre-SR and there is no increase in the oil spill quantity for a guillotine failure.
5	Primary CS does not change and release volume increases	The primary CS Post-SR is the same as Pre-SR and there is an increase in the oil spill quantity for a guillotine failure.
6	Primary CS shifted downstream	The primary CS Post-SR is located downstream of the primary Pre-SR CS.
7	No primary CS downstream	An oil spill passes the last pre-defined CS location Post-SR, but there is a Pre-SR pre-defined primary CS.
8	Oil spill shifted from land to water	An oil spill reached water Post-SR but remained on land Pre-SR.

* *A primary CS is defined as one for which the time required for an spill response team to arrive and deploy the required tactic is less than the time of arrival of the leading edge of the spilled oil. That is, the necessary tactic is deployed prior to the oil arriving at the site.*

Risk Increase Results

Of the 995 segments showing a change in risk parameters due to SR, 34 were found to require mitigation because of increased spill risk from SR. For all other segments, receptor risk was determined to remain essentially unchanged.

Mitigation Analysis

Once the segments with a possible receptor risk change from SR were identified using the DNV screening model and verified using the ASA model, evaluation of mitigation measures was the next step. The recommended mitigation measures must be those that are effective in reducing the receptor risk back to neutral, in other words, back to the Pre-SR risk level. Since SR will not affect the frequency/likelihood of a spill, mitigating the difference in spill consequence was the focus of the mitigation analysis. To accomplish this, a comprehensive list of implementable and effective mitigation measures was developed. Each measure on the list was revaluated to determine if it would be effective at reducing risk to the pre-SR level. Where applicable, combinations of measures were also evaluated.

DNV Recommendations

A complete list of effective mitigations was developed for each segment requiring mitigation. The recommended measures would eliminate the receptor risk increase, achieving the risk-neutral target. The specific enhancements were implemented between 2006 and 2011 and have been incorporated into this plan.

2.3.6 Alyeska 2008/2009 Integrity Management (IM) Risk Assessment

In order to comply with US DOT Integrity Management regulations (49 CFR 195.452), Alyeska re-performed the potential spill volume calculations, fate and transport analyses, and risk assessment evaluations for TAPS in 2008 and 2009. These tasks used the same methodologies established by DNV in 2005 (see Sec. 2.3.4 and 2.3.5). A general discussion of the results of this Alyeska work follows.

2.3.6.1 Spill Volumes and Spill Transport Modeling

Some minor adjustments and refinements were made to the DNV maximum spill volume calculations for TAPS performed in 2005. These included:

1. Maximum flow rate was set at (b) (7)(F), (b) (3)) which is the maximum mechanical limit as of 2008 given the current pumping configuration of TAPS.

2. A more detailed analysis was used in calculating maximum pressure at each spill point (every 500 feet maximum spacing). This included the use of a higher resolution elevation vs. milepost dataset than was used in 2005. This higher resolution elevation dataset also allowed for a better estimate of pipeline static draindown volumes that accounts for storage of oil in dips and valleys (low spots) of the pipeline profile after a pipeline section is hydraulically isolated.

3. Only operational tanks at the pump stations were considered, and the maximum operating volumes experienced by the tanks in recent years was used in lieu of maximum design capacity of the tanks.

In general, there was a marginal reduction in maximum potential spill volumes across the TAPS system when compared to the 2005 DNV calculations. This is an expected outcome in view of the fact that the static draindown portion of a spill (controlled by topography and valve placements) is typically much larger that the dynamic portion of the spill (spill volume that occurs before pumps are shut down and valves are closed). As noted in Number 2 above, a more refined calculation of static draindown volume was made that was generally lower than in 2005 for a given spill point.

2.3.6.2 Risk Assessment

Modifications and updates were made to the risk model developed by DNV in 2005 when Alyeska performed its DOT IM Risk Assessment in 2009. These included:

1. Revision of baseline frequency of occurrence for corrosion and sabotage. For corrosion, the frequency was increased from 3.0×10^{-5} occurrences per mile of pipe per year to 6.0×10^{-5} because it was believed for various reasons that an increase was warranted. In contrast, the assumed frequency of sabotage was lowered from 1.8×10^{-4} to 1.5×10^{-4} to account for additional years of operation with no sabotage from 2005 to 2009. Note in Table 2-30 that the equivalent spill hole size (0.1 in., 1 inch, and 10 inch) distribution frequency for each threat category was not changed from the 2005 risk modeling.

2. Several additional “modifying” factors were used to raise or lower the likelihood of spill occurrence for various causal agents (threat categories) on TAPS – see Table 2-30. This included modifying factors to account for vibration, slope stability, in-line-inspection (ILI) measurements, stress corrosion cracking, etc.

In general, the results of the 2009 risk modeling were consistent with the DNV results of 2005 with the exception of an increase in risk due to corrosion in specific locations.

TABLE 2-30 SUMMARY OF CHANGES FROM 2005 DNV ANALYSIS – BASE PIPELINE LEAK FREQUENCIES USED IN ALYESKA 2009 RISK ASSESSMENT

Element	Base Frequency	Modifying Factors	Hole Size Distribution			Reason for Change(s)
	Change	Change	Small	Medium	Large	
Mechanical Defects	None	Added vibration effects factor	↔	↔	↔	Added potential vibration effects at Atigun and Thompson Pass area
Excavation Damage	None	Slight increase in excavation activity factor	↔	↔	↔	Fine tuning of modifying factor
Corrosion	Increase	Added several new factors	↔	↔	↔	Consensus of stakeholders was base frequency needed to be increased. More in-depth review by SMEs identified additional modifying factors that should be used
Sabotage	Decrease	None	↔	↔	↔	Additional years of operating history without incident
Seismic	None	Added vibration effe ts factor	↔	↔	↔	Correction of hose size distributions
Hydraulic Events	None	Added vibration effects factor	↔	↔	↔	Improved scoring system of previous modifying factor and added vibration factor
Maintenance Damage	None	None	↔	↔	↔	Additional years of operating history without incident
Settlement Events	None	Added modifying factor	↔	↔	↔	Added direct observation of settlement factor
Washout Events	None	Improved previous modifying factor	↔	↔	↔	More detailed analysis with SME and more detailed modifying fact r

Alyeska 2009 Relative to DNV 2005 Analysis Legend: ↓Decrease ↑Increase ↔Unchanged

2.3.7 Projections of Future Spill Risks

It is difficult to predict future spills for TAPS, based on the high degree of variability among the parameters that dictate spill occurrence rates and sizes. Nonetheless, an evaluation of the recorded history of TAPS and the risk assessments conducted over the past ten years leads to several confident projections about the future risk of TAPS.

As TAPS ages, certain factors will tend to increase risk, while other factors decrease risk. In general, there are several factors that will tend to decrease the risk for TAPS over the next 10 – 20 years:

- surveillance programs have improved over the years, reducing the chances of a leak
- no new causes of leaks have surfaced in the past 10 – 15 years, therefore management is aware of most causes of a leak
- pipeline management has improved with experience, reducing the chances and outcome of potential leaks

In contrast, a few factors may conspire to increase the risk of spills for TAPS in the coming years:

- pipeline corrosion is increasing over time, more in some areas than others, thus increasing the chances for a leak
- as the pipe ages, wear-out of components may lead to an increase in leak frequencies The net effect is a constant level in the predicted risk for TAPS in the next few years.

2.3.8 Pipeline Dynamic Spill Volumes

The State of Alaska response planning standard (RPS) volume for a crude oil pipeline facility is identified as the volume of oil which results from the following formula:

$$RPS = (L-H) \times C + FR \times (TD + TSD)$$

where

L = Pipeline length between pumping or receiving stations or valves

H = Pipeline hydraulic characteristics due to terrain profile

C = Pipeline capacity in barrels per linear measure

FR = Pipeline flow rate in barrels per time period

TD = Estimated time to detect a spill event

TSD = Time needed to shut down the pipeline pump or system

Alyeska uses the TAPS Oil Spill Program to determine the RPS for the pipeline. This is a computer model originally designed for use during pipeline construction planning. It was used to model the dynamic volume of oil contained in different segments of the mainline for placement of valves. Using this model,

Alyeska was able to determine the best location for valves to reduce oil outflow and minimize environmental damage if the pipeline were to have a rupture. The original model had approximately 10,000 survey data points that were used to calculate the hydraulic characteristics due to terrain profile (H). Over the years the model has been improved with the addition of more survey data points. The model currently has over 100,000 survey data points from which to calculate dynamic spill volumes between pipeline segments. The increase in survey data points has allowed for a refinement of the RPS calculation to provide the most accurate estimate possible.

The model assumes a guillotine cut of the main pipeline has occurred and calculates outflow based on the following assumptions:

1. Oil surge wave travels at 3,500 feet per second until it is detected as a leak at the nearest pump station.
2. Dispatcher reaction time to recognize a leak
    a. 60 seconds for sections between (b) (7) to Thompson Pass
    b. 254 seconds for the section between Thompson Pass to Valdez. This is due to “slack line” in this segment
    c. Leak verification time of 7 seconds
3. Mainline pump rundown time of 6 seconds
4. Pipeline shutdown of 30 seconds before mainline valves begin to close
5. Remote gate valve (RGV) closure rates between 4, 5, 8, and 12 minutes
6. Static spill volumes (i.e., draindown of remaining oil in pipe once the valve(s) have closed)
7. Input parameters used are as follows:
    a. Crude oil properties (such as specific gravity, viscosity, and throughput rate)
    b. Pipeline survey data showing mileposts and centerline elevations
    c. Pump station suction and discharge pressures for hydraulic gradient definition
    d. Mainline valves locations, elevations, and nominal closure times
    e. Contingency area segment boundaries (drainages)
    f. Downstream detection only versus both directions (accommodates “slack line” conditions)
8. Spill program outputs are as follows:
    a. For every survey data point
        i. Spill volume upstream and downstream of data point before and after valve closure
        ii. Summation of total volume spilled

b. Maximum spill volume in each contingency area and segment (i.e., maximum of totals above for each area)[1]

9. Assumptions for determination of calculated values are as follows:

a. All dynamic properties listed above.

b. Valves seal completely at closure times of 4, 5, 8, and 12 minutes.[2]

c. (b) (7)(F), (b) (3)

d. “Slack line” into pump stations is eliminated as appropriate.

e. Drag reducing agent is injected at (b) (7)(F), (b) (3) .

f. Valdez incoming mainline pressure is 650 psig.

g (b) (7)(F), no block, gate, or check valve in place.

h. (b) (7)(F), a mainline check valve installed.

i. (b) (7)(F), mainline block valve installed.

j. Pipeline flow rate of 1.5 million barrels of oil per day.

2.3.8.1 Calculated Dynamic Spill Volume Table

Table 2-31 shows the spill volumes calculated using approximately 100,000 data points. This represents the best available survey information for TAPS. This table assumes that (b) (7)(F) is offline. (b) (7)(F), (b) were to be online, the dynamic spill volume would change from the 4th segment of the North Fork of the Chandalar River through the 3rd segment of Shaw Creek. Those changes are shown in the right-most column of the table for the affected areas.

[1] Between 1997 and 2000, Alyeska tested all mainline valves to determine if the individual valves seal to design standards. Valves not sealing to design standards would allow some amount of oil to pass through the valve seat and contribute more oil to a given segment.

By looking at those segments associated with valves not sealing to design standards, it was determined that if the adjoining segment completely drained through the valve, the additional oil contributed to that adjacent segment did not exceed the Response Planning Standard scenario volume.

[2] Valve closure times are set at variable closure rates to prevent the development of a hydraulic shock which could potentially damage the pipeline.

TABLE 2-31 CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP	Potential Spill Volume Barrels	Potential Spill Volume Barrels (PS07 online)
Putuligayuk River - Segment 1	1	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	[redacted]
Sag River 1 - Segment 1	1	[redacted]	[redacted]	[redacted]
Sag River 1 - Segment 2	1	[redacted]	[redacted]	[redacted]
Sag River 1 - Segment 3	1	[redacted]	[redacted]	[redacted]
Sag River 2 - Segment 1	2	[redacted]	[redacted]	[redacted]
Sag River 2 - Segment 2	2	[redacted]	[redacted]	[redacted]
Sag River 2 - Segment 3	2	[redacted]	[redacted]	[redacted]
Sag River 2 - Segment 4	2	[redacted]	[redacted]	[redacted]
Sag River 2 - Segment 5	2	[redacted]	[redacted]	[redacted]
Sag River 3 - Segment 1	3	[redacted]	[redacted]	[redacted]
Sag River 3 - Segment 2	3	[redacted]	[redacted]	[redacted]
Sag River 3 - Segment 3	3	[redacted]	[redacted]	[redacted]
Sag River 3 - Segment 4	3	[redacted]	[redacted]	[redacted]
Sag River 3 - Segment 5	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 1	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 2	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 3	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 4	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 5	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 6	3	[redacted]	[redacted]	[redacted]
Toolik/Kuparuk River - Segment 7	3	[redacted]	[redacted]	[redacted]
Itkillik River	3	[redacted]	[redacted]	[redacted]
Galbraith Lake - Segment 1	3	[redacted]	[redacted]	[redacted]
Galbraith Lake - Segment 2	3	[redacted]	[redacted]	[redacted]
Galbraith Lake - Segment 3	3	[redacted]	[redacted]	[redacted]
Galbraith Lake - Segment 4	4	[redacted]	[redacted]	[redacted]
Atigun River - Segment 1	4	[redacted]	[redacted]	[redacted]
Atigun River - Segment 2	4	[redacted]	[redacted]	[redacted]
Atigun River - Segment 3	4	[redacted]	[redacted]	[redacted]
Atigun River - Segment 4	4	[redacted]	[redacted]	[redacted]

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (PS07 online)
North Fork Chandalar River	4			
Dietrich River - Segment 1	4			
Dietrich River - Segment 2	4			
Dietrich River - Segment 3	4			
Dietrich River - Segment 4	4			
Middle Fork Koyukuk River - Segment 1	4			
Middle Fork Koyukuk River - Segment 2	4			
Middle Fork Koyukuk River - Segment 3	4			
Middle Fork Koyukuk River - Segment 4	4			
Middle Fork Koyukuk River - Segment 5	4			
Middle Fork Koyukuk River - Segment 6	4			
Middle Fork Koyukuk River - Segment 7	4			
South Fork Koyukuk River - Segment 1	4			
South Fork Koyukuk River - Segment 2	4			
South Fork Koyukuk River - Segment 3	4			
Jim River - Segment 1	4			
Jim River - Segment 2	4			
Jim River - Segment 3	4			
Jim River - Segment 4	4			
Jim River - Segment 5	4			
Jim River - Segment 6	5			
Jim River - Segment 7	5			
Bonanza/Fish Creek - Segment 1	5			
Bonanza/Fish Creek - Segment 2	5			
Bonanza/Fish Creek - Segment 3	5			

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (PS07 online)
Bonanza/Fish Creek - Segment 4	5			
Bonanza/Fish Creek - Segment 5	5			
Bonanza/Fish Creek - Segment 6	5			
Bonanza/Fish Creek - Segment 7	5			
Bonanza/Fish Creek - Segment 8	5			
Kanuti River - Segment 1	5			
Kanuti River - Segment 2	5			
Kanuti River - Segment 3	5			
West Fork Dall River - Segment 1	5			
West Fork Dall River - Segment 2	5			
West Fork Dall River - Segment 3	5			
Ray River - Segment 1	5			
Ray River - Segment 2	5			
Ray River - Segment 3	5			
Ray River - Segment 4	5			
Ray River - Segment 5	5			
Ray River - Segment 6	5			
Ray River - Segment 7	5			
Ray River - Segment 8	5			
Ray River - Segment 9	5			
Ray River - Segment 10	5			
Yukon River - Segment 1	5			
Yukon River - Segment 2	5			
Yukon River - Segment 3	5			
Yukon River - Segment 4	5			

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	S (b) (7)(F), (b) (3)	Potential Spill Volume Barrels	Potential Spill Volume Barrels (PS07 online)
Yukon River - Segment 5	5		(b) (7)(F), (b) (3)	
Yukon River - Segment 6	5			
Yukon River - Segment 7	6			
Yukon River - Segment 8	6			
Yukon River - Segment 9	6			
Isom Creek - Segment 1	6			
Isom Creek - Segment 2	6			
Hess Creek - Segment 1	6			
Hess Creek - Segment 2	6			
Hess Creek - Segment 3	6			
Hess Creek - Segment 4	6			
Hess Creek - Segment 5	6			
Hess Creek - Segment 6	6			
Hess Creek - Segment 7	6			
Hess Creek - Segment 8	6			
Tolovana River - Segment 1	6			
Tolovana River - Segment 2	6			
Tolovana River - Segment 3	6			
Tolovana River - Segment 4	6			
Tolovana River - Segment 5	6			
Tolovana River - Segment 6	6			
Tolovana River - Segment 7	6			
Tatalina River - Segment 1 and 2	6			
Tatalina River - Segment 3	6			
Tatalina River - Segment 4	6			

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP	Potential Spill Volume Barrels	Potential Spill Volume Barrels (PS07 online)
Tatalina River - Segment 5	6	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	[redacted]
Tatalina River - Segment 6	6	[redacted]	[redacted]	[redacted]
Tatalina River - Segment 7	7	[redacted]	[redacted]	[redacted]
Tatalina River - Segment 8	7	[redacted]	[redacted]	[redacted]
Tatalina River - Segment 9	7	[redacted]	[redacted]	[redacted]
Tatalina River - Segment 10	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 1	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 2	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 3	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 4	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 5	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 6	7	[redacted]	[redacted]	[redacted]
Washington/Aggie Creeks - Segment 7	7	[redacted]	[redacted]	[redacted]
Chatanika River - Segment 1	7	[redacted]	[redacted]	[redacted]
Chatanika River - Segment 2	7	[redacted]	[redacted]	[redacted]
Chatanika River - Segment 3	7	[redacted]	[redacted]	[redacted]
Chatanika River - Segment 4	7	[redacted]	[redacted]	[redacted]
Chatanika River - Segment 5	7	[redacted]	[redacted]	[redacted]
Chatanika River - Segment 6	7	[redacted]	[redacted]	[redacted]
Goldstream Creek - Segment 1	7	[redacted]	[redacted]	[redacted]
Goldstream Creek - Segment 2	7	[redacted]	[redacted]	[redacted]
Goldstream Creek - Segment 3	7	[redacted]	[redacted]	[redacted]
Goldstream Creek - Segment 4	7	[redacted]	[redacted]	[redacted]
Goldstream Creek - Segment 5	7	[redacted]	[redacted]	[redacted]
Goldstream Creek - Segment 6	7	[redacted]	[redacted]	[redacted]

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP	Potential Spill Volume Barrels	Potential Spill Volume Barrels (PS07 online)
Chena River - Segment 1	7	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	
Chena River - Segment 2	7			
Chena River - Segment 3	7			
Chena River - Segment 4	7			
Moose/French Creeks - Segment 1	7			
Moose/French Creeks - Segment 2	7			
Moose/French Creeks - Segment 3	7			
Moose/French Creeks - Segment 4	7			
Little Salcha - Segment 1	8			
Little Salcha - Segment 2	8			
Little Salcha - Segment 3	8			
Salcha River - Segment 1	8			
Salcha River - Segment 2	8			
Salcha River - Segment 3	8			
Salcha River - Segment 4	8			
Salcha River - Segment 5	8			
Shaw Creek - Segment 1	8			
Shaw Creek - Segment 2	8			
Shaw Creek - Segment 3	8			
Big Delta Junction - Segment 1	8			
Big Delta Junction - Segment 2	8			
Big Delta Junction - Segment 3	8			
Big Delta Junction - Segment 4	8			
Big Delta Junction - Segment 5	8			
Big Delta Junction - Segment 6	8			
Big Delta Junction - Segment 7	8			

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (PS07 online)
Big Delta Junction - Segment 8	8	[redacted]		
Big Delta Junction - Segment 9	8			
Big Delta Junction - Segment 10	8			
Jarvis Creek - Segment 1	8			
Jarvis Creek - Segment 2	8			
Jarvis Creek - Segment 3	8			
Jarvis Creek - Segment 4	9			
Jarvis Creek - Segment 5	9			
Jarvis Creek - Segment 6	9			
Jarvis Creek - Segment 7	9			
Delta River - Segment 1	9			
Delta River - Segment 2	9			
Delta River - Segment 3	9			
Delta River - Segment 4	9			
Delta River - Segment 5	9			
Delta River - Segment 6	10			
Trashy Mountain - Segment 1	10			
Phelan Creek - Segment 1	10			
Phelan Creek - Segment 2	10			
Phelan Creek - Segment 3	10			
Phelan Creek - Segment 4	10			
Phelan Creek - Segment 5	10			
Phelan Creek - Segment 6	10			
Phelan Creek - Segment 7	10			
Paxson/Summit Lakes - Segment 1	10			
Paxson/Summit Lakes - Segment 2	10			
Paxson/Summit Lakes - Segment 3	10			
Paxson/Summit Lakes - Segment 4	10			
Paxson/Summit Lakes - Segment 5	10			
Paxson/Summit Lakes - Segment 6	10			

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (PS07 online)
Paxson/Summit Lakes - Segment 7	10	[redacted]		
Paxson/Summit Lakes - Segment 8	10			
Paxson/Summit Lakes - Segment 9	10			
Paxson/Summit Lakes - Segment 10	10			
Paxson/Summit Lakes - Segment 11	10			
Paxson/Summit Lakes - Segment 12	10			
Paxson/Summit Lakes - Segment 13	10			
Paxson/Summit Lakes - Segment 14	10			
Paxson/Summit Lakes - Segment 15	10			
Paxson/Summit Lakes - Segment 16	10			
Paxson/Summit Lakes - Segment 17	10			
Paxson/Summit Lakes - Segment 18	10			
Paxson/Summit Lakes - Segment 19	10			
Paxson/Summit Lakes - Segment 20	10			
Paxson/Summit Lakes - Segment 21	10			
Spring Creek - Segment 1	10			
Spring Creek - Segment 2	10			
Spring Creek - Segment 3	10			
Spring Creek - Segment 4	10			
Spring Creek - Segment 5	10			
Haggard/Sourdough Creeks - Segment 1	10			
Haggard/Sourdough Creeks - Segment 2	10			
Haggard/Sourdough Creeks - Segment 3	10			
Haggard/Sourdough Creeks - Segment 4	10			
Haggard/Sourdough Creeks - Segment 5	10			
Gulkana River - Segment 1	10			
Gulkana River - Segment 2	10			
Gulkana River - Segment 3	10			
Dry Creek - Segment 1	10			
Tazlina River - Segment 1	10			

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP	Potential Spill Volume Barrels	Potential Spill Volume Barrels (PS07 online)
Tazlina River - Segment 2	10	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	[redacted]
Tazlina River - Segment 3	11	[redacted]	[redacted]	[redacted]
Tazlina River - Segment 4	11	[redacted]	[redacted]	[redacted]
Tazlina River - Segment 5	11	[redacted]	[redacted]	[redacted]
Yetna River - Segment 1	11	[redacted]	[redacted]	[redacted]
Klutina River - Segment 1	11	[redacted]	[redacted]	[redacted]
Copper River - Segment 1	11	[redacted]	[redacted]	[redacted]
Willow Creek - Segment 1	11	[redacted]	[redacted]	[redacted]
Willow Creek - Segment 2	11	[redacted]	[redacted]	[redacted]
Willow Creek - Segment 3	11	[redacted]	[redacted]	[redacted]
Willow Creek - Segment 4	11	[redacted]	[redacted]	[redacted]
Tonsina River - Segment 1	11	[redacted]	[redacted]	[redacted]
Tonsina River - Segment 2	11	[redacted]	[redacted]	[redacted]
Little Tonsina River - Segment 1	11	[redacted]	[redacted]	[redacted]
Little Tonsina River - Segment 2	11	[redacted]	[redacted]	[redacted]
Little Tonsina River - Segment 3	11	[redacted]	[redacted]	[redacted]
Little Tonsina River - Segment 4	12	[redacted]	[redacted]	[redacted]
Little Tonsina River - Segment 5	12	[redacted]	[redacted]	[redacted]
Tiekel River - Segment 1	12	[redacted]	[redacted]	[redacted]
Tiekel River - Segment 2	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 1	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 2	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 3	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 4	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 5	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 6	12	[redacted]	[redacted]	[redacted]
Tsina River - Segment 7	12	[redacted]	[redacted]	[redacted]
Lowe River - Segment 1	12	[redacted]	[redacted]	[redacted]
Lowe River - Segment 2	12	[redacted]	[redacted]	[redacted]
Lowe River - Segment 3	12	[redacted]	[redacted]	[redacted]

TABLE 2-31 (CONTINUED) CALCULATED DYNAMIC SPILL VOLUME TABLE

Contingency Area/Segment	Section	Starting PLMP (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (b) (7)(F), (b) (3)	Potential Spill Volume Barrels (PS07 online)
Lowe River - Segment 4	12	[redacted]	[redacted]	[redacted]
Lowe River - Segment 5	12	[redacted]	[redacted]	[redacted]
Lowe River - Segment 6	12	[redacted]	[redacted]	[redacted]

2.4 CONDITIONS INCREASING RISK OF A DISCHARGE [18 AAC 75.425(e)(2)(D)(i) AND (ii)]

Table 2-32 provides a summary of the conditions that might increase the risk of a discharge specific to the pipeline system and a list of actions that have been taken to eliminate or minimize increased risks.

TABLE 2-32 CONDITIONS THAT MIGHT INCREASE THE RISK OF DISCHARGE

Condition	Mitigating Measures
Earthquakes	Original design criteria and construction of the pipeline factored in earthquake magnitude for all seismic zones which the pipeline crosses. Maximum design is 8.5 Richter in the section of pipeline from PLMP 678 to Valdez.
Avalanches	All rock and snow avalanche zones that transect the pipeline were mapped during original design. The pipeline is buried in all known avalanche zones.
Erosion in floodplains	The pipeline is buried in all floodplain areas. Where river movement is encroaching on the pipeline, revetments or river training structures have been erected. Erosion in floodplains is monitored during breakup and flood conditions.
Sabotage	24-hour security is provided at all pump stations and response bases. Valves, pump stations, and major bridge crossings are protected with fencing. Roving security patrols are conducted. Closed circuit television cameras are located at strategic locations.
Corrosion	The pipeline is coated and taped for protection from corrosion. A cathodic protection system is in place. Corrosion is monitored using "smart pigs."
Over pressuring the pipeline	Operating procedures are in place to prevent over pressuring of the pipeline. In addition, the closure time on mainline valves is controlled to prevent over pressuring.
Vehicular impacts on piping	Protective barriers have been erected or placed in areas where piping is exposed. Speed limits are enforced within pump stations. Headache racks have been placed at access gates leading to locations on the pipeline where the road goes under the pipeline.
Excavation damage	All excavation on the pipeline ROW and within the pump station must be carried out in accordance with the requirements of *MR-48, Trans-Alaska Pipeline Maintenance and Repair Manual*.
Bridge collapse	Integrity inspections are conducted on all bridges on the pipeline every five years and following large magnitude earthquakes approaching design limits.
Mechanical defects	The pipeline and pump stations are subject to continuous monitoring and/or inspection.
Valve leaking	Buried mainline valves have soil gas probes installed that are monitored each year for signs of hydrocarbons. The mainline valves receive servicing annually. Mainline valves are also currently undergoing performance testing to ensure adequate sealing performance. A portion of this work includes inspection and repair as necessary of component parts. Valves within the pump station receive regular preventive maintenance.
Settlement	Settlement of the pipeline is monitored through the use of curvature pig surveys and the installation of settlement monitoring rods. Aboveground pipe and belowground pipe is also monitored to determine slope stability.

Additional information is provided in the risk analysis studies (Technica, Inc., and Robert Taylor and Associates) in Volume 1, Section 2.3, "Potential Discharge Analysis."

2.5 DISCHARGE DETECTION FOR CRUDE OIL PIPELINES AND PUMP STATIONS [18 AAC 75.425(e)(2)(E)]

Alyeska uses a combination of visual observation and an on-line leak detection system that is designed to detect low volume leaks on a system-wide basis (both pipeline and pump station tankage). The leak detection systems are discussed in detail in Volume 1, Section 2.1.8, “Piping Corrosion Control and Leak Detection Program.”

2.6 COMPLIANCE SCHEDULE AND WAIVERS [18 AAC 75.425(e)(2)(F)]

This section outlines the compliance schedule and waivers requested to be in accordance with *18 AAC 75.005* through *18 AAC 75.085*.

2.6.1 Truck Offloading Secondary Containments

Alyeska has been granted waivers for the requirements of *18 AAC 75.015(g)* for secondary containment systems of locations listed below and in Table 2-6.

- [redacted] port generator fuel tank, 47-1-TK-3 (not to exceed five fillings per year) (Figure 2-7)

(b) (7)(F), (b) (3)

Camp fuel tank, 10-TK-1100 (one filling per year) (Figure 2-8)

Building fuel tank, 36-TK-25 (one filling per year) (Figure 2-9)

Building fuel tank, 39-TK-2 (one filling per year) (Figure 2-9)

The waiver of requirements is based on:

- Infrequent filling,
- Small volume transfers, and
- Alternate measures to prevent and reduce the consequences of a spill.

Alyeska has also been granted a waiver for the requirements of *18 AAC 75.065* for the required monthly inspections for tank 42-TK-220 at Pump Station 12. Per the waiver, the approved inspection frequency for this tank is quarterly (Figure 2-10).

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
INDUSTRY PREPAREDNESS AND PIPELINE PROGRAM
TAPS/JPO Section

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May 10, 2002

Robert I. Shoaf
Vice President
Alyeska Pipeline Service Company
1835 S. Bragaw Street, MS 528
Anchorage, AK 99512

RECEIVED
MAY 14 2002
Rob Shoaf
Vice President

File No. 306.20. (TAPS)

Commitment ☐ Info Only ☑
CARTS No: 4882 Dept: FBK
Assigned To: R. Skrauch
Regulatory Specialist: L. Shier
Commit Date: None

Dear Mr. Shoaf:

SUBJECT: Request for 18 AAC 75.015 Waiver – Galbraith Lake and PS-3 MCCF Tanks, Secondary Containment Requirements, ADEC Response to Government letter 02-18481 dated April 16, 2002.

We are in receipt of Government Letter #02-18481 dated April 16, 2002, which requests a variance from the requirements of 18 AAC 75.075(g), tank truck loading areas and permanent unloading areas.

Based upon the April 16, 2002 letter, prior inspections and correspondence between Alyeska and the Department of Environmental Conservation (Department), and the Department's review of regulations and guidance, the Department GRANTS the request for a waiver of the tank truck loading and permanent

(b) (7)(F), (b) (3)

This request is granted with the understanding that the usage pattern described for the tanks, along with the procedural and system safeguards as described in Government Letter 02-18481 remain unchanged.

Because a key factor in granting this waiver is based on the frequency of refill of there tanks, the Department is requiring immediate written notification if:

- The frequency of refilling the Galbraith generator diesel tank exceeds the current yearly average of five times over the next year; and
- (b) (7)(F), (b) (3) CF generator diesel tank is put back into service.

If you have any questions or comments, please contact me at 271-4113 or after May 13, 2002, at my new telephone number, 257-1375.

Sincerely,

Bonnie Friedman
Section Manager

cc: Mr. William Howitt, APSC
Mr. Greg Kinney, APSC
Mr. Jerry Brossia, JPO
Mr. John Kerrigan, JPO
Ms. Becky Lewis, ADEC
Mr. Carl Lautenberger, EPA/JPO
Mr. Mike Wrabetz, BLM/JPO

FIGURE 2-7 WAIVER FOR GALBRAITH AIRPORT GENERATOR FUEL TANK, 47-1-TK-3

STATE OF ALASKA

DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
INDUSTRY PREPAREDNESS PROGRAM
TAPS/JPO Section

FRANK H. MURKOWSKI, GOVERNOR

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February 7, 2006

File No: 304.20

STD	DOT	LAW	SEC	ENV	EHS
EXC	Received				FIRE
P/L					ROW
VMT	FEB 13 2006				PRJ
SRV					ENG
S/R	Kathie May Reg Affairs Mgr				DC
H/R					
Other:					

Info Only ☑ Commitment ☐
GL No: 7002 Action No:
RI: PETERSON
RS: TO PETERSON
Commit Date: N/A

Mr. Robert I. Shoaf
JPO Executive Liaison
Alyeska Pipeline Service Company
P. O. Box 196660
Anchorage, Alaska 99519-6660

SUBJECT: **Response to Alyeska Government Letter (GL) No. 7002, Request for 18 AAC 75.015 Waiver for PS03 MCCF Tank Offloading Area, Trans-Alaska Pipeline System (TAPS) Pipeline Oil Discharge Prevention and Contingency Plan (CPlan), ADEC Plan Number: 015-CP-4131.**

Dear Mr. Shoaf:

On December 14, 2005 Alyeska submitted a request to the Alaska Department of Environmental Conservation (Department) for continuance of a waiver for the tanker truck offloading secondary containment requirements of 18 AAC 75.075(g) for the MCCF aboveground generator diesel fuel storage tank located at Pump Station 3 (b) (7) (F), (b) A waiver for this tanker truck offloading area was originally granted by the Department on May 10, 2002 based on the standby status of the subject tank. The Department understands that the MCCF tank has not been filled since the time the waiver was granted.

In compliance with the May 10, 2002 waiver, Alyeska has notified the Department of plans to put the MCCF generator diesel tank back into regular and infrequent service that will involve annual loading. The first loading is anticipated between February 15, 2006 and March 15, 2006 and will occur during no more than two separate days during that period. The request for an extension of the waiver for secondary containment at the tanker truck offloading area for this regulated tank is based primarily on its infrequent use.

The Department's Guidance No. IPP 2004-01, Secondary Containment Requirements at Tank Truck and Rail Car Loading and Unloading Areas applies to this request. Guidance No. IPP 2004-01 is provided for clarification to the requirements in 18 AAC 75.075(g) that require secondary containment for tank truck offloading areas. The Guidance states that the requirements for secondary containment do not apply for temporary or infrequent use of tank truck transfer areas that are located within the confines of a facility. The Guidance provides definitions of "temporary or infrequent use" that include "…'seasonal use' such as annual maintenance requirements…."[1]

[1] Alaska Department of Environmental Conservation Guidance No. IPP-2004-01, Secondary Containment Requirements at Tank Truck and Rail Car Loading and Unloading Areas, August 5, 2004, p. 3.

FIGURE 2-8 WAIVER FOR PS03 MCCF CAMP FUEL TANK, 10-TK-1100

Mr. Robert I. Shoaf
Alyeska Pipeline Service Co.

February 7, 2006

The Department finds that the tanker truck offloading at the MCCF generator diesel tank falls within this definition so long as it occurs on no more than several days during the annual loading process. Therefore, the Department **GRANTS** the request for a waiver to the tank truck permanent offloading area secondary containment at the (b) (7) (F) (b) CF generator diesel tank.

This request is granted with the understanding that the usage pattern described in Alyeska GL 7002 remains unchanged. Because the infrequency of filling this tank is a key factor in granting this waiver, the D(7)(F) is requiring immediate written notification if the frequency of refilling the (b) (7)(F), (b) (3) enerator diesel tank exceeds the usage pattern described above.

Please note that the Guidance referenced here does not exempt facilities from compliance with other applicable State or Federal regulations that address secondary containment or tank truck loading/unloading areas.[2]

Thank you for coordinating this waiver request with the Department. Please feel free to contact me at (907) 257-1374 if you have any questions.

Sincerely,

Rebecca A. Lewis

Rebecca A. Lewis
Section Manager

Enclosure: Alaska Department of Environmental Conservation Guidance No. IPP 2004-01, Secondary Containment Requirements at Tank Truck and Rail Care Loading and Unloading Areas

cc: Wes Willson, Alyeska
Rich Skvarch, Alyeska
Jerry Brossia, AO, BLM/JPO
Mike Thompson, SPC, ADNR/JPO
Carl Lautenberger, EPA/JPO
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Sam Means, ADNR
Dennis Gnath, ADNR/JPO
Mark Fink, ADF&G
Robin Willis, ADF&G

[2] Guidance No. IPP 2004-01, August 5, 2004, p. 2.

FIGURE 2-8 (CONTINUED) WAIVER FOR PS03 MCCF CAMP FUEL TANK, 10-TK-1100

STATE OF ALASKA

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RIS KMM JDB LDW JS MDK
LJS RECEIVED JFJ
RKB PCN
RBS AUG 1 0 2000 WJS
TLS
Rob Shoaf
Vice President
Other Gov. Rec.

August 7, 2000

Robert J. Shoaf
Vice President
Alyeska Pipeline Service Company
1835 S. Bragaw, MS 528
Anchorage, AK 99512

Action ☐ Info Only ☑
CARTS No.: 3892
Assigned To: R. Dawson
Dept.: FBU
Due Date: None

Dear Mr. Shoaf:

RE: Waiver request – APSC Government Letter No. 00-15691. Truck Unloading area secondary containment waiver at Pump Stations 6 and 9.

This letter is in response the above referenced letter in which Alyeska requests a waiver to the requirements for tank truck loading areas and permanent unloading areas found at 18 AAC 75.075(g). The Department hereby **GRANTS** the requested waiver, with the following conditions.

(b) (7)(F), (b) (3)

Alyeska, are required to be in compliance with the requirements of 18 AAC 75.075(g).

2) The number of "fills", i.e. truck unloading events at these two truck unloading areas must not exceed 2 per calendar year without written approval from the Department. The procedures described in Alyeska's Government Letter No. 00-15691 must be maintained and followed in accordance with the submittal.

3) The written procedures, examples of which were attached the Alyeska Government Letter No. 00-15691, utilized for each "fill" must be maintained at the facility in accordance with Alyeska's record retention requirements for "quality records".

4) The current *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan* (CP-35-1) must be edited to reflect the procedures in place with the effect of this waiver.

FIGURE 2-9 WAIVER FOR PS06 OSCP BUILDING FUEL TANK, 36-TK-25 AND PS09 OSCP BUILDING FUEL TANK, 39-TK-2

Robert J. Shoaf -2- August 7, 2000

If you have any questions please contact me at the number listed above.

Sincerely,

Bonnie Friedman
Section Manager

cc: Larry Shier, APSC
Mike Wrabetz, BLM/JPO
Carl Lautenberger, EPA/JPO
Bonnie Friedman, Section Manager

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FIGURE 2-9 (CONTINUED) WAIVER FOR PS06 OSCP BUILDING FUEL TANK, 36-TK-25 AND PS09 OSCP BUILDING FUEL TANK, 39-TK-2

24796
24959

STATE OF ALASKA

SEAN PARNELL, GOVERNOR

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DEPT. OF ENVIRONMENTAL CONSERVATION
DIVISION OF SPILL PREVENTION AND RESPONSE
INDUSTRY PREPAREDNESS PROGRAM
JPO/FR/PI SECTION

Info Commitment
GL No: 24959 Action No:
RI: K. Kortenhof
RS: K. Kortenhof W. Wilson
Commit Date: 07/09/12

May 25, 2012

File No.: 306.55
(TK 170 & TK 220)

BAS	DOT	[illegible]	[illegible]	ENV	HSEC
EXC		Received			FIRE
PL					ROW
VMT		JUN – 4 2012			PAJ
SRV					ENG
		Regulatory Affairs Department			
HR					ACTG
Other: H. Cooper					

Joseph Robertson
JPO Executive Liaison
Alyeska Pipeline Service Company
P. O. Box 196660
Anchorage, AK 99519

Subject: **Alyeska Pipeline Service Company Government Letter No. 24959, Monthly Tank Inspection Waiver Request for Pump Station 7 and Pump Station 12, Tank 170 and Tank 220, Trans-Alaska Pipeline System Oil Discharge Prevention and Contingency Plan No. 11-CP-4071.**

Dear Mr. Robertson:

On January 9, 2012 the Alaska Department of Environmental Conservation (department) received Alyeska Pipeline Service Company's (Alyeska)'s Government Letter No. 24959 (GL 24959), requesting a waiver from required monthly exterior visual inspection at Tanks 170 and 220.[1] Alyeska proposed an alternative annual visual exterior inspection for both tanks, and included proposed revisions to the Trans-Alaska Pipeline System (TAPS) Oil Discharge Prevention and Contingency Plan (plan) to formalize the proposed schedule.

In support of the proposed schedule revision, Alyeska included a copy of the department's Guidance Document No. IPP 93-03, Temporary and/or Emergency Aboveground Storage Tanks and noted a meeting between department and Alyeska staff where the Guidance was discussed in August 2011.

[1] Department regulations at 18 AAC 75.065(a) require that field constructed aboveground oil storage tanks be maintained and inspected consistent with the requirements of the American Petroleum Institute's *Tank Inspection, Repair, Alteration, and Reconstruction*, Third Edition, December 2001, and Addendum 1, September 2003 (API 653). API 653, Section 6.3 requires routine visual inspections of the exterior surface of in-service tanks by personnel familiar with the facility and tank operations, and such inspections are required at least monthly.

FIGURE 2-10 WAIVER FOR PS12 TANK 42-TK-220

The plan identifies both Tanks 170 and 220 as "out of service" and "...to be retained for cold restart purposes."[2] At the meeting held in August 2011, it was clarified that Alyeska views these tanks as out of service, but not "removed from service" in the department's regulatory context. At 18 AAC 75.065(o), department regulations define state "...'removed from service' means not in regular use for the service intended and not included in a regular maintenance and inspection program in accordance with this section." If a tank that has been "removed from service" for more than one year is again placed into service, it will be required to comply with regulations at 18 AAC 75.065(j) in addition to the design, construction, operation, maintenance, and repair requirements that applied prior to its removal from service.

Again, based on the conversation at the August 2011 meeting, it is the department's understanding that Alyeska plans to continue maintaining and inspecting both Tanks 170 and 220 in anticipation that future cold restart circumstances will require their use for an unspecified length of time. In some sense, it is understood that their use will be for emergency purposes in that the ability to restart the pipeline in cold restart conditions is critical to maintaining the integrity and operation of TAPS and that oil spills may be prevented by that operation. On the other hand, cold restart is an anticipated, planned for operation for which detailed procedures have been developed.

Guidance No. IPP 93-03 was written "...to establish the Department's position regarding inspection criteria for aboveground storage tanks that will be used for temporary and/or emergency oil storage only. Temporary and/or emergency oil storage is limited to spill response or for preventing a spill from occurring." The Guidance identifies the targeted storage tanks as oil spill response equipment and recognizes that most of such tanks would be "...old, riveted or bolted...taken out of regular service and...not be API 653 inspected," which essentially are tanks "removed from service" as defined in current regulations. The requirement for tanks that will be considered oil spill response equipment is that they remain structurally sound and are located within secondary containment. Specific words must be stenciled on the outer shell of those emergency tanks, and plans must specify how mechanical integrity will be determined and the length of their use as temporary storage must be specified as well.

Cold restart procedures and plans are not described in the plan except for statements concerning Tanks 170 and 220. Both tanks are identified as "required facilities," and the plan states that one or both of them will be used during cold restart. Their use is the basis for Pump Station 7 and Pump Station 12 specific Response Planning Standard volumes in Part 5 of the plan as well. Department staff have been briefed on cold restart procedures

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[2] Plan 11-CP-4071, Volume 1, Ed. 3, Rev.0, Table 2-2, December 21, 2011, pp. 2-22 and 2-23.

FIGURE 2-10 (CONTINUED) WAIVER FOR PS12 TANK 42-TK-220

through participation in the Joint Pipeline Office. As such, we are aware that there is no clear limitation on the length of time Tanks 170 and 220 may be used if activated during cold restart operations. Usage could range from weeks to months or longer. Tanks 170 and 220 would also be usable during oil spill emergencies not related to cold restart, although they are not described for this purpose in the plan or in its hypothetical response scenarios.

Alyeska derives clear benefit from maintaining and inspecting Tanks 170 and 220 consistent with the requirements of API 653. Specifically, when Alyeska activates these tanks to implement established cold restart procedures, there will be no delay caused by uncertainty about their condition or specific limitations on their length of possible use. Therefore, the issue of whether these two tanks should be routinely inspected as required by API 653, Section 6.3, cannot be answered by Guidance No. IPP 93-03, which is intended for tanks "removed from service." The key questions for the department are whether an equivalent level of protection will be achieved by an alternative technology or procedure and whether there are practical limitations that make less frequent exterior visual inspections acceptable.

In terms of level of protection being achieved by alternative technology or procedures, the most significant circumstance is that both tanks are not currently being used to store oil. The plan asserts that potential for corrosion is significantly reduced in tanks that are in cold service, defined as not currently storing oil. The plan also states that internal sacrificial anodes provide appropriate cathodic protection for tanks in cold service, such as Tanks 170 and 220.

As a practical matter, Tank 220 is located at an unmanned facility on the Richardson Highway. There are no other in-service regulated tanks at the facility, and the majority of its structures have been dismantled or removed. Tank 170 is located at Pump Station 7, which serves as a routine check point for Alyeska technicians and baseline personnel traveling north from Fairbanks. In addition, two active in-service regulated aboveground storage tanks are present at the same location.

The deciding considerations are that both tanks are in-service and are required facilities that are subject to full compliance with department regulations at 18 AAC 75.065. In addition while both tanks are empty of petroleum, they are both required facilities for TAPS operational activities, i.e., cold restart operations. There is no practical reason for not conducting monthly inspections at Tank 170 when the inspections for the two adjacent regulated tanks are conducted. There is no substantial record-keeping burden that would make this a problem. The only difference for Tank 220 is that it is located at an unmanned facility. Even so, it is on a publicly maintained highway that makes it accessible year-round.

FIGURE 2-10 (CONTINUED) WAIVER FOR PS12 TANK 42-TK-220

THEREFORE, the department finds that the routine external visual inspections as described in API 653, Section 6.3 are required to be fully performed and documented on a monthly basis for Tank 170. The department WAIVES the monthly external visual inspection requirement for Tank 220, and requires that the inspections be performed and documented on a quarterly basis. Quarterly inspections for TK 220 may not be performed less than 45 days apart. If any conditions listed in API 653, Section 6.3.1.3 are identified during the routine external visual inspections of either tank, they must be promptly evaluated by an authorized inspector and the assessment submitted to the department.

Notwithstanding this waiver, Alyeska must remain in compliance with all department statutes and regulations concerning aboveground petroleum storage tanks and related piping and secondary containment.

If you have any questions concerning this waiver, please contact Graham Wood at 907-269-6494 or Bill Haese at 907-269-6426.

Sincerely,

Rebecca A. Spiegel

Rebecca A. Spiegel
Section Manager

Electronic cc:

Graham Wood, ADEC
Bill Haese, ADEC
Wes Willson, APSC
Kim Kortenhof, APSC
John Baldridge, APSC
Hally Cooper, APSC
Ron Dunton, BLM
Nolan Heath, BLM
Mike Thompson, ADNR
Mike Wrabetz, BLM
Matt Carr, EPA
Ron Doyel, ADEC
Sam Saengsudham, P.E., ADEC

FIGURE 2-10 (CONTINUED) WAIVER FOR PS12 TANK 42-TK-220

Section 3. Supplemental Information [18 AAC 75.425(e)(3)]

3.1 FACILITY DESCRIPTION AND OPERATIONAL OVERVIEW [18 AAC 75.425(e)(3)(A)]

The 800-mile, trans-Alaska pipeline carries crude oil south across Alaska from Prudhoe Bay on the Beaufort Sea to Port Valdez on Prince William Sound. The pipeline and related facilities occupy 16.3 square miles in Alaska. See Figure 3-1.

This contingency plan covers the Trans Alaska Pipeline System (TAPS) from PS01 incoming crude oil meters, which measure the amount of oil received from North Slope producers, to the boundary of the Valdez Marine Terminal (remote gate valve [RGV] 972), including associated mainline pump stations and facilities. A separate oil spill prevention and response plan has been prepared for the Valdez Marine Terminal (*CP-35-2, Valdez Terminal Oil Discharge Prevention and Contingency Plan*).

CP-35-1 provides detailed response information for each section of the pipeline right-of-way (ROW).

To facilitate oil spill response coordinator (OC) coverage, the pipeline has been divided into three major regions: Northern, Central, and Southern. These regions describe the areas of responsibility for the day-to-day functions of the oil spill coordinators and encompass all facilities that fall within the regional boundaries.

(b) (7)(F), (b) (3)



The geographic areas of responsibility for initial spill responders are described in Section 1.5.1.

Volume 3, Section 3, “Containment Actions,” contains tables subdivided further as follows:

- Contingency Areas – That part of a major drainage basin that could be affected by an oil spill from the section of the pipeline traversing the drainage basin.
- Segments – A subdivision of a contingency area determined by minor drainage features for purposes of containment actions, access, and environmental information.

As described in Section 1.5, Alyeska follows a tiered response concept for oil spills. This response adds layers of personnel and equipment to an incident as needed. Personnel from the nearest pump stations or response bases north and south of the spill site respond first. As needed, other Alyeska assets are notified and requested to respond with personnel and equipment.

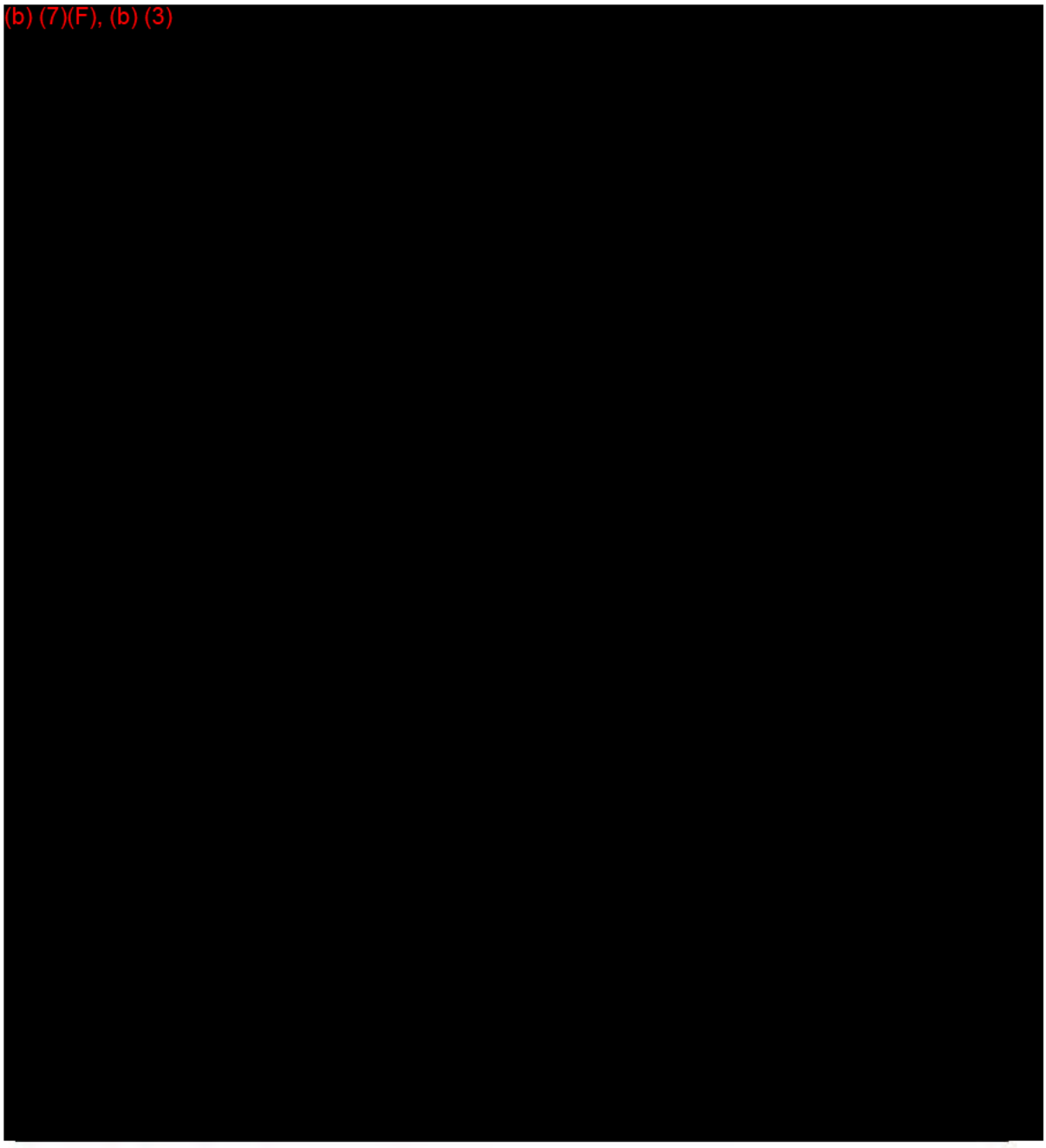


FIGURE 3-1 MAP OF TRANS ALASKA PIPELINE SYSTEM

3.1.1 Pipeline System

TAPS is an 800-mile, 48-inch crude oil pipeline beginning on the Arctic coast of Alaska and ending at the Valdez Marine Terminal (VMT) on the shores of Prince William Sound. (The VMT is covered in *CP-35-2, Valdez Terminal Oil Discharge Prevention and Contingency Plan.*) Approximately half of the length of the pipeline is buried and half is above ground on vertical support members. Pump stations are located along the length of the pipeline to provide the energy to move the oil through the pipeline at a maximum design throughput of 2.1 million barrels per day. Due to declining production and Strategic Reconfiguration, (b) (7)(F), (b) (3) [redacted] are in offline status. Pipeline flows are enhanced by the injection of a drag reducing agent at various locations along the pipeline. Remote gate valves, manual gate valves, and automatic check valves are strategically placed along the pipeline to reduce the amount of potential spillage in the event of a pipeline rupture. The pipeline operation is remotely controlled from the Operations Control Center (OCC). Local control of the pump station can be accomplished from operating pump station control rooms.

The construction of the pipeline exceeds industry construction standards particularly to reduce the risk and size of oil spills. The pipe itself was specially engineered and manufactured for TAPS. It was manufactured in three grades, with minimum yield strengths of 60,000, 65,000 and 70,000 pounds per square inch, and in two wall thicknesses, 0.462 and 0.562 inch with -5% to +15% tolerance. Subsequent new construction, such as the Atigun reroute section, has exceeded standards even further.

Due to the various changes in environment, the design and construction of the pipeline varies across its route. Over half of the line is above ground because of the inherent instability of the ice-rich soils in much of Alaska.

The method chosen for emplacement of pipe along the route depended mainly on soil conditions and the effects of pipeline heat on the soil. The crude is delivered to Alyeska from North Slope producers at about 120°F and drops to 74°F arriving at Valdez when pumped at 1.0 million barrels per day throughput. In stable soils, where thawing would not result in an unacceptable disruption of the terrain and distortion of the pipe, the line is buried in a conventional manner. The pipe was placed on a layer of bedding material in a ditch 8 to 35 feet deep and then covered with prepared gravel padding and soil fill material.

For areas in which thermal degradation of ice rich soil might create unstable soil conditions, the pipeline is built above ground. In such places, the pipe is supported by crossbeams installed between vertical supports placed in the ground. The vertical supports are positioned approximately every 60 feet along the line. The pipe is insulated with 3¼ inches of fiberglass, jacketed with galvanized steel, and mounted on a Teflon-coated shoe that can slide horizontally on the crossbeams.

Thawing in the ground around the vertical supports is prevented by thermal devices that are installed as necessary inside the supports and monitored annually. The thermal devices consist of heat pipes containing a refrigerant that vaporizes below ground, rises and condenses in aboveground radiators, thus removing ground heat whenever the ground temperature exceeds the temperature of the air.

To allow for thermal expansion and contraction of the aboveground pipe, the pipeline was constructed and built in a flexible trapezoidal zigzag configuration. In this design, longitudinal expansion of the pipe is relieved by sideways movement.

Anchor structures for above-grade pipe are erected approximately every 800 to 1,800 feet to hold the pipe in position. Between anchors, the pipe can move up to 146 inches for thermal expansion with an additional 24 inches for seismic movement. At points where potential earthquake movement might be larger, bumpers are installed on the supports to absorb pipe impact and limit the horizontal movement of the pipe.

At the Denali Fault, the dominant geological active fault crossed by the line, the design permits as much as 20 feet of horizontal and 5 feet of vertical displacement.

At one highway crossing and two points where caribou migration routes cross the pipeline in permafrost soils, the pipe is buried in a refrigerated ditch. Refrigeration plants at each point circulate chilled brine through loops of 6-inch pipe to maintain the soil in a stable, frozen condition.

At more than 800 river and stream crossings, the pipe either bridges the waterway or is buried beneath it. At most small streams, the pipe bridges the water on conventional supports. At 14 locations, however, special bridges were built. Pipe across the Yukon River is attached to a highway bridge. Standard plate girder structures were built at ten crossings. Special suspension bridges were constructed across the Tanana and Tazlina rivers, and a tied-arch bridge was constructed for the Gulkana River. Floodplains are monitored annually.

Seventy-one gate valves and 84 check valves are strategically placed in the line to limit oil spill volumes to meet regulatory requirements. Check valves, designed to be held open by flowing oil and to close automatically when the oil flow stops, prevent the reverse flow of oil on uphill sections of the line. To increase pipeline operating efficiency, some check valves are held fully open hydraulically using actuators, thus lifting valve components entirely free of the oil stream. These valves are fitted with flow transducers which, in the event of reduced or stopped oil flow or pressure drop, cause the valves to close. Remote gate valves (RGVs) are on flat terrain and downhill slopes and isolate sections of the line by mechanical means. Sixty-two of the 71 gate valves can be operated remotely by the Operations Control Center or from the pump stations. All valves can be operated manually for maintenance of the line or for spill isolation, if needed. A list of pipeline valve locations, which includes valve number, type, whether the valve is aboveground or belowground, pipeline milepost, and pipeline stationing, is shown in Table 3-1.

The pipe is coated and taped for protection from corrosion. Zinc ribbons were buried parallel to the underground pipe to serve as sacrificial anodes. They prevent a flow of current away from the pipe which would corrode its metal surface. As a part of a comprehensive corrosion control monitoring program, the pipeline is checked periodically for corrosion by an instrumental “corrosion pig” and corrective measures are taken when necessary. An instrumented pig is a device propelled inside the pipe by oil flow, designed to measure specific conditions such as corrosion or deformation.

The monitoring program extends to pipe settlement. In addition to an electronic pig used to detect pipe deformation, special monitoring rods are employed to directly check for any settlement or other movement of the buried pipeline at several critical locations. These metal rods are welded to the top of the pipe at periodic locations and extend to several feet above the ground surface. By surveying the elevations of the rods at regular intervals, Alyeska engineering can readily detect any signs of pipe settlement or shifting.

Where unusual conditions are noted and require data verification, the buried pipe may be excavated and examined. Repairs are made when necessary.

TABLE 3-1 PIPELINE VALVE LOCATIONS

Valve No.	Type	Aboveground/ Belowground	Pipeline Milepost	Pipeline Station
(b) (7)(F), (b) (3)				

TABLE 3-1 (CONTINUED) PIPELINE VALVE LOCATIONS

Valve No.	Type	Aboveground/ Belowground	Pipeline Milepost	Pipeline Station
(b) (7)(F), (b) (3)				

TABLE 3-1 (CONTINUED) PIPELINE VALVE LOCATIONS

Valve No.	Type	Aboveground/ Belowground	Pipeline Milepost	Pipeline Station
(b) (7)(F), (b) (3)				

TABLE 3-1 (CONTINUED) PIPELINE VALVE LOCATIONS

Valve No.	Type	Aboveground/ Belowground	Pipeline Milepost	Pipeline Station
(b) (7)(F), (b) (3)				

TABLE 3-1 (CONTINUED) PIPELINE VALVE LOCATIONS

Valve No.	Type	Aboveground/ Belowground	Pipeline Milepost	Pipeline Station
(b) (7)(F), (b) (3)				

3.1.2 Pump Station and Response Base Locations

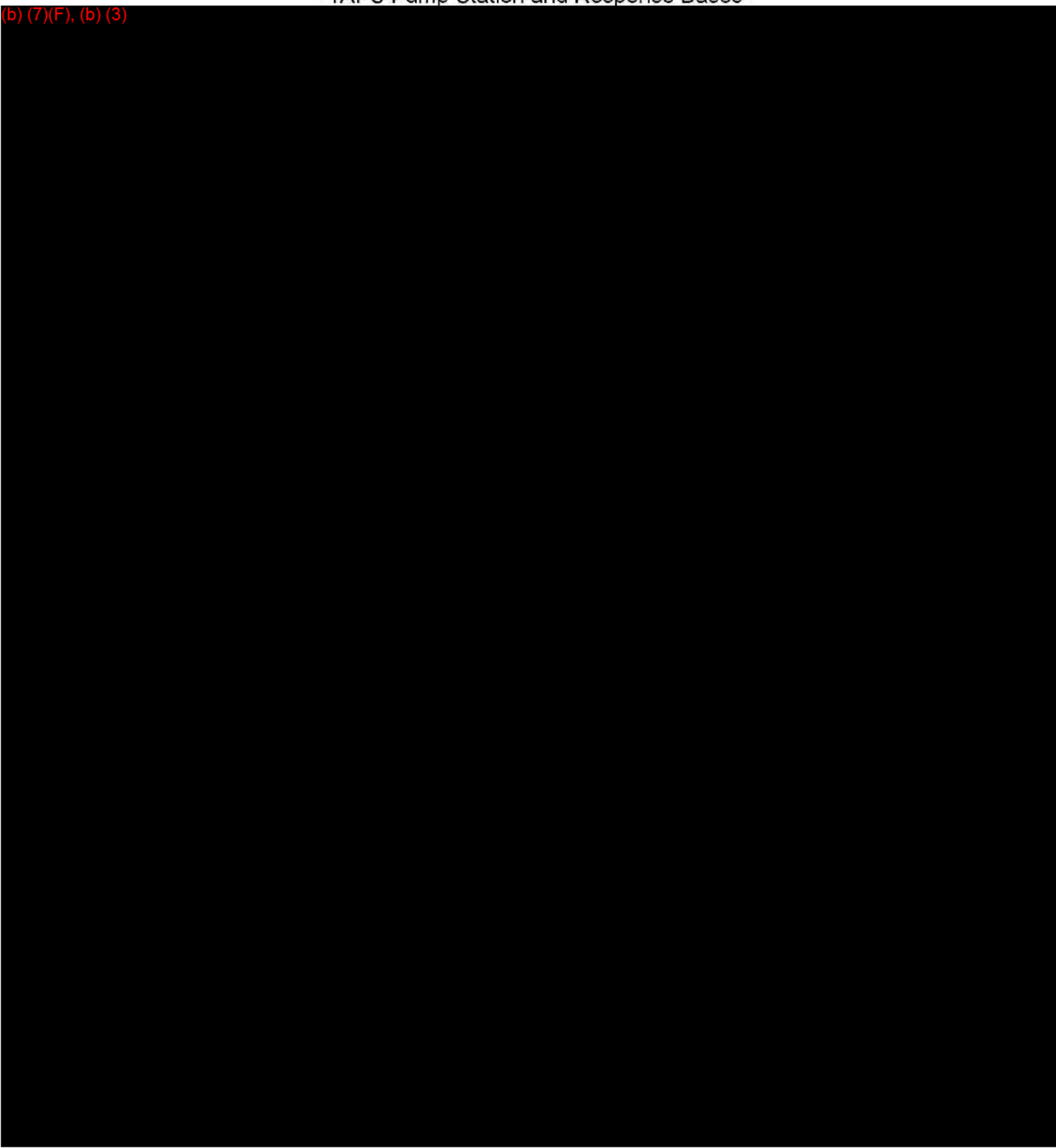
TAPS pumping stations are similar in layout and function, but there are certain differences due to unique locale and station tasks. Included at most stations are breakout tanks, containment dikes, water supplies, waste disposal, permanent living quarters (PLQs), office buildings, a shop/warehouse, and other facilities for pipeline operation and maintenance. Stations are protected by security fences and continuous monitoring. A summary of some of the unique aspects of the individual pump station sites is provided below.

TAPS response bases are often co-located with pump stations. These bases provide maintenance and oil spill response for the areas surrounding the pump station/response base. A location summary of the response bases is provided below.

Figure 3-2 depicts the locations of all pump stations and response bases.

TAPS Pump Station and Response Bases

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

[redacted]

3.1.3 Crude Oil Breakout and Product Tanks

Tank construction and materials are compatible with the substances stored and conditions of storage, consistent with *API Std 650.* The large crude oil breakout tanks are constructed with features for drainage of tank bottoms to minimize corrosion. Tanks and pipelines have been installed with a cathodic protection system. The bottom of each tank is internally coated with an epoxy coating to prevent corrosion. Each diked area around the bulk storage tanks was installed at construction with a liner to prevent percolation of spilled crude oil or diesel fuel. Dike drain valves are gate valves and are closed and locked following drainage of the dike area. Bypass valves remain open.

3.1.4 Secondary Containment and Drainage

One important aspect of spill prevention is the secondary containment constructed around the tanks. Secondary containment consists of dikes, berms, and walls built around the tanks to contain a spill in case a leak or rupture occurs in the tanks or the connective piping. Engineering design, security measures, training programs, leak detection systems, and inspection schedules also contribute to the prevention of spills.

All crude oil and petroleum product storage tanks are located within secondary containment systems. These secondary containment systems can contain at least 110% of the capacity of the tanks with an additional allowance for rain or snow. Refer to Volume 1, Section 2.1.6, “Oil Tanks,” and Volume 1, Section 2.1.7, “Description of Secondary Containment Areas,” for details.

Tables 3-2 and 3-3 present tank and containment information for regulated storage tanks at Alyeska’s pump station facilities.

TABLE 3-2 REGULATED STORAGE TANKS

Location	Description	Tank Identification	Tank Type	Foundation Type	Capacity (barrels)	Construction Standard	Last/Next External Inspection	Last/Next Internal Inspection	Overfill Technologies		Average Monthly Usage (barrels)	Comments
									Devices Installed	Existing Overfill Protection		
[redacted]					[redacted]						[redacted]	
	Turbine fuel	31-TK-117	Field constructed	Soil		API G/5th - Welded steel construction	2007/2012	2002/2022	Capacitance level switch with local alarm	External level switched alarm (j)(1) modified for testing		
	JP-4 fuel (out of service)	32-TK-3	Shop fabricated	Soil		Welded steel construction	NIS-2000	NIS-2000	Capacitance level switch with local alarm	External level switched alarm and shutoff (j)(1) with testing capability		[redacted].
	Turbine fuel (out of service)	33-TK-137	Field constructed	Soil		API G/5th - Welded steel construction	NIS-2009	NIS-2009	NA	NA		
	Turbine fuel (out of service)	34-TK-147	Field constructed	Soil		API G/5th - Welded steel construction	2007/NIS-2010	2002/NIS-2010	NA	NA		
	Turbine fuel	35-TK-157	Field constructed	Soil		API G/5th - Welded steel construction	2012/2017	2011/2021	Capacitance level switch with local alarm	External level switched alarm (j)(1) modified for testing		35-TK-157 was removed from service in 2005 and returned to service in 2013 with an under tank leak detection system.
	Turbine	35-TK-3301R	Shop fabricated	Elevated		Welded steel construction	2011/2016	See Note 7	Visual, liquid	Transfer		
	Turbine	35-TK-3401R	Shop fabricated	Elevated		Welded steel construction	2011/2016	See Note 7	Level gauge	Monitoring		
	Turbine fuel (out of service)	36-TK-167	Field constructed	Soil		API G/5th - Welded steel construction (both)	NIS-2000	NIS-2000	NA	NA		
	Turbine fuel (out of service)	36-TK-168	Field constructed	Soil			NIS-2000	NIS-2000	NA	NA		
	Turbine fuel	37-TK-177	Field constructed	Soil		API D&G/6th - Welded steel construction (both)	2006/2011	1996/2016	Capacitance level switch with local alarm (both)	Level switched alarm (j)(1) modified for testing (both)		
	Turbine fuel	37-TK-178	Field constructed	Soil			2006/2011	1996/2016				
	Turbine fuel (out of service)	38-TK-187	Field constructed	Soil		API G/5th - Welded steel construction (both)	NIS-1998	NIS-1998	NA	NA		
	Turbine fuel (out of service)	38-TK-188	Field constructed	Soil			NIS-1998	NIS-1998	NA	NA		
	Turbine fuel (out of service)	39-TK-197	Field constructed	Soil		API G/5th - Welded steel construction (both)	2005/NIS-2008	1995/NIS-2008	NA	NA		
	Turbine fuel (out of service)	39-TK-198	Field constructed	Soil			2005/NIS-2008	1995/NIS-2008	NA	NA		

TABLE 3-2 (CONTINUED): REGULATED STORAGE TANKS

Location	Description	Tank Identification	Tank Type	Foundation Type	Capacity (barrels)	Construction Standard	Last/Next External Inspection	Last/Next Internal Inspection	Overfill Technologies		Average Monthly Usage (barrels)	Comments
									Devices Installed	Existing Overfill Protection		
(b) (7)(F), (b) (3)	Turbine fuel (out of service)	40-TK-207	Field constructed	Soil	(b) (7)(F), (b) (3)	API G/5th - Welded steel construction (both)	NIS-1998	NIS-1998	NA	NA	NA	
	Turbine fuel (out of service)	40-TK-208	Field constructed	Soil			NIS-1998	NIS-1998	NA	NA	NA	
	Turbine fuel (out of service)	42-TK-227	Field constructed	Soil		API G/5th - Welded steel construction (both)	1998/NIS-2005	1993/NIS-2005	NA	NA	NA	
	Turbine fuel (out of service)	42-TK-228	Field constructed	Soil			1998/NIS2005	1993/NIS-2005	NA	NA	NA	
						DOT CRUDE OIL BREAKOUT TANKS						
	Crude balancing tanks	31-TK-110	field-constructed	Modified ring wall		API 650 design, welded steel, cone roof (both)	2012/2017	2012/2032	Capacitance level switch with local and OCC alarms (both)	Level switched alarm (j)(1) modified for testing (both)		
		31-TK-111	Field constructed	Modified ring wall			2012/2012	2003/2023				
	Crude relief	33-TK-130	Field constructed	Soil		API 650 design, welded steel, cone roof	2011/2016	2001/2021	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		
	Crude relief	34-TK-140	Field constructed	Ring wall		API 650 design, welded steel, cone roof	2013/2018	2008/2028	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		
	Crude relief	35-TK-150	Field constructed	Soil		API 650 design, welded steel, cone roof	2010/2015	2005/2025	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		
	Crude relief (out of service)	36-TK-160	Field constructed	Soil		API 650 design, welded steel, cone roof	NIS-1998	NIS-1998	NA	NA		
	Crude relief (out of service)	37-TK-170	Field constructed	Soil		API 650 design, welded steel, cone roof	2006/Annual cold restart-2010	2010/2030	Level alarm switch and shut-off devices are removed, but level gauge will be available for reconnection in the event of a cold restart	NA		Tank to be retained for cold restart purposes.
	Crude relief (out of service)	38-TK-180	Field constructed	Soil		API 650 design, welded steel, cone roof	NIS-1998	NIS-1998	NA	NA		
	Crude relief	39-TK-190	Field constructed	Soil		API 650 design, welded steel, cone roof	2010/2015	2011/2021	Capacitance level switch with local and OCC alarms	Level switched alarm (j)(1) modified for testing		

TABLE 3-2 (CONTINUED): REGULATED STORAGE TANKS

Location	Description	Tank Identification	Tank Type	Foundation Type	Capacity (barrels)	Construction Standard	Last/Next External Inspection	Last/Next Internal Inspection	Overfill Technologies		Average Monthly Usage (barrels)	Comments
									Devices Installed	Existing Overfill Protection		
(b) (7)(F), (b) (3)	Crude relief (out of service)	40-TK-200	Field constructed	Soil	(b) (7)(F), (b) (3)	API 650 design, welded steel, cone roof	NIS-1998	NIS-1998	NA	NA		
	Crude relief (out of service)	42-TK-220	Field constructed	Soil		API 650 design, welded steel, cone roof	2005/Annual cold restart-2005	2005/2025	Level alarm switch and shutoff devices are removed, but level gauge will be available for reconnection in the event of a cold restart	NA		Tank to be retained for cold restart purposes.
						MINOR TANKS – HORIZONTAL ABOVEGROUND						
	Diesel (MCCF)	10-TK-1100	Shop fabricated	Elevated		Welded steel construction	2006/2011	1996/NA	Capacitance level switch with local alarm	External level switched alarm (j)(1) with testing capability	(b) (7)(F), (b) (3)	This tank is waived from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated February 7, 2006, and Alyeska GL No. 7002.
	Diesel (Galbraith)	47-1-TK-3	Shop fabricated	Elevated		Welded steel construction	2011/2016	See Note 7	Capacitance level switch with local alarm	External level switched alarm (j)(1) with testing capability		This tank is waived from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated May 10, 2002, and Alyeska GL No. 02-18481.
	Diesel	36-TK-25	Field constructed	Elevated		Welded steel construction	2010/2015	2005/2025	Level alarm switch and shutoff	External level switched alarm and shutoff (j)(1) with testing capability		Tank 36-TK-25 is waived (with conditions) from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated August 7, 2000, and Alyeska GL No. 00-15691.
	Diesel	37-TK-28	Shop fabricated	Elevated		Welded steel construction	2006/2011	1996/2016	Level alarm switch and shutoff	External level switched alarm (j)(1) with testing capability		
	Diesel	39-TK-2	Field constructed	Elevated		Welded steel construction	2006/2011	1996/2012	Level alarm switch and shutoff	External level switched alarm (j)(1) with testing capability		Tank 39-TK-2 is waived (with conditions) from tanker truck offloading secondary containment requirements of 18 AAC 75.075(g). Reference ADEC letter dated August 7, 2000, and Alyeska GL No. 00-15691.
	Diesel (out of service)	42-TK-25	Shop fabricated	Elevated		Welded steel construction	2006/NIS	1996/NIS	NA	NA		
	Diesel (out of service)	42-TK-26	Shop fabricated	Elevated		Welded steel construction	2006/NIS	1996/NIS	NA	NA		

Notes:

1. *Tanks below 10,000 gallons in volume are not listed in this table.*
2. *All tanks are of welded steel construction and all in service tanks are in good operating condition.*
3. *All tanks except TK-170, TK-177 and TK-178 were constructed between 1974 and 1976 and put in service in 1977.*
4. *Tank 37-TK-170 was installed between 1981 and 1983 and commissioned in 1983.*
5. *Tanks 177 and 178 were constructed in 1980 and put in service in 1983.*
6. *NIS = Not in Service.*
7. *Internal inspections are conducted as required by API Std 653 calculations. The exceptions to this are the horizontal tanks, which have external access to the tank bottom for ultrasonic thickness test of the tank bottom rather than an internal inspection. See Section 2.1.6.2.*

TABLE 3-3 LEAK DETECTION MONITORING, TANK INSPECTIONS, AND SECONDARY CONTAINMENT INSPECTIONS

(b) (7)(F), (b) (3) [redacted]

CP-35-1, Volume 1, Sections 2.1.6.2, 2.1.6.3, and 2.1.7.1 Tank Inspection Procedures and Leak Detection Monitoring								
Visually for signs of leakage, tank and piping damage, closed dike drains, water accumulations	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	Weekly	Quarterly
QI Inspection including overfill devices. Tank perimeter and tank farm dike visually for leaks, tank shell distortion or settlement, corrosion, foundation damage, insulation or appurtenance problems.	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Monthly	Quarterly
Turbine fuel tank bottom for leaks visually or by sensitive gauging system or under tank leak detection.	Monthly TK-117	NA	NA	Monthly TK-157	NA	Monthly TK-177 TK-178	NA	NA
CP-35-1, Volume 1, Section 2.1.7.1 Secondary Containment for Storage Tanks								
Inspection of Crude Oil Tank Farm secondary containment	Weekly	Weekly	Weekly	Weekly	NA	Weekly	Weekly	Weekly
Inspection of other secondary containment as noted	Weekly Turbine Tank Farm	NA	Weekly Airport JP-4 and Diesel	Airport JP-4	Weekly OSCP Bldg Fuel Supply Diesel, JP-4, and Gasoline Tank Farm	Weekly Diesel	Weekly Diesel	NA
CP-35-1, Volume 1, Section 2.1.8.4 Pump Station Leak Detection								
Station and tank farms looking for leaks in piping and valves.	Weekly	Weekly	Weekly	Weekly	Weekly	NA	Weekly	Monthly

3.1.5 Pump Station Support Systems

Pump station support systems are part of the prevention program designed for the safe operation of the stations.

3.1.5.1 Utility Air Systems

Compressed air is distributed throughout the station for maintenance work. Two compressors on a skid in the station's Shop/Warehouse Building provide the station with utility air.

3.1.5.2 Fire Extinguishing Systems

Halon is considered the first line of extinguishment in buildings where flammable hydrocarbons may be found. It can be discharged automatically by ultraviolet (UV) detectors, thermal detectors, or by hazardous atmosphere detection systems. Manual discharge can be accomplished either by pull stations in the hallways or by firing switches on the fire control panel. The Aqueous Film Forming Foam (AFFF) system serves as a backup to the Halon system.

All active pump stations have at least one fire truck, except PS01. PS01 is covered by the North Slope Operator's mutual aid agreement. Extinguishing agents on board are as follows:

- Water
- Foam
- Dry chemical powder

Hose stations and portable fire extinguishers are located throughout the pump stations.

3.1.5.3 Crude Oil Sump System

All buildings that contain crude oil piping have sump tanks equipped with pumps to return drained liquids to the crude relief tank. Each process area generally has a separate sump for safety. A booster pump system is used to pump out the crude relief tank and reinject the oil into the pipeline.

3.1.5.4 Station Heating and Ventilation System

The heating and ventilation systems for buildings containing gas or oil are designed to provide a constant ventilating rate of one air change every 15 minutes with temperatures of at least 55°F in winter and no more than 95°F during summer. For emergency conditions when 20% lower explosive limit (LEL) is detected in the building by the hazardous atmosphere detection system, the ventilation system automatically provides one air change every 5 minutes.

Heating is accomplished by fired boilers that are in the Shop/Warehouse Building. They burn fuel gas at the four northernmost stations and turbine fuel at the rest. The boilers heat Therminol, a liquid heating medium, which is circulated throughout the station.

Ventilation is accomplished by blowers or fans, which brings in outside air and exhaust air through ventilators.

3.1.5.5 Station Refrigeration [redacted]

Stations built on permafrost are underlain with refrigeration coils to prevent thawing of the soil underneath. The refrigeration units are skid-mounted, dual-system compressors and condensers that pump super-cooled brine through the coils to keep the soil frozen and, therefore, stable.

3.1.5.6 DRA Injection [redacted]

DRA is injected in lieu of adding pumping capacity. DRA is a long hydrocarbon molecule that reduces drag, permitting more oil throughput at any given pumping horsepower.

3.1.6 Pump Station Crude Oil Movement

The following general description applies to all pump stations. During normal operations, there are four distinct crude oil flowpaths through the station:

1. Mainline crude oil flow through the main pumps
2. Mainline pressure relief flow
3. Main and booster pump station recirculation
4. Relief oil flow

Each of these flow paths is described below.

1. *Mainline Crude Oil Flow Through the Main Pumps* - In normal operations, crude oil enters the pump station through a motorized header gate valve, BL1, passes through the leading edge flow meter (LEFM) outside of the Manifold Building and enters the Manifold Building. Inside the building, the crude is diverted through ball valve S1 into a suction line upstream of M1 and S2 (Figure 3-3). This line carries the crude out of the Manifold Building to a mainline pump suction header where three pump suction lines (one for each pump) pick it up and feed it into the suction side of the mainline pumps. At the mainline pumps, the oil pressure is boosted and the oil is routed through the discharge line and through discharge valve D1 back into the mainline. Upon leaving the Manifold Building, the mainstream flow of crude passes through another LEFM, where its volume and flow rate are again measured, and it leaves the station through the battery limit gate valve BL2. During [redacted] pig receiving and launching operations, valves S2 and D2, which discharge flow from the receiver or provide flow to the launcher, are used. At [redacted], valves D1, D2, and M3 control launching operations.

2. *Mainline Pressure Relief Flow* - Two 36-inch pressure relief lines are provided for the mainline. Pressure controllers (PICs) sense mainline suction pressure and actuate two or three hydraulic pressure control valves, PICV-04A, B, and C, relieving the pressure to the crude oil breakout tank. The discharge pressure controller senses pressure at the station discharge line and actuates two or three hydraulic pressure control valves, PICV05A, B, and C, that relieve discharge pressure to the breakout tank. Relief valve set point pressures are set from the Operations Control Center (OCC).

All relief valve systems have a spare valve. Each relief valve can be blocked on each side to allow for removal or maintenance.

3. *Main and Booster Pump Station Recirculation Flow* – Recirculates all three pumps through the station for station start or cold restart. If oil exceeds the temperature set point, the thermal control valve (TCV) opens to allow flow to the breakout tank.

4. *Relief Oil Flow* – Crude oil is returned to the mainline from the breakout tank through a booster pump, discharging to the main pump suction line.

Pump station piping and instrumentation drawings (P&IDs) are kept up to date in Alyeska's Technical Document and Drawing Index (TDDI). Figure 3-3 shows a typical pump station main piping system configuration.

(b) (7)(F), (b) (3)

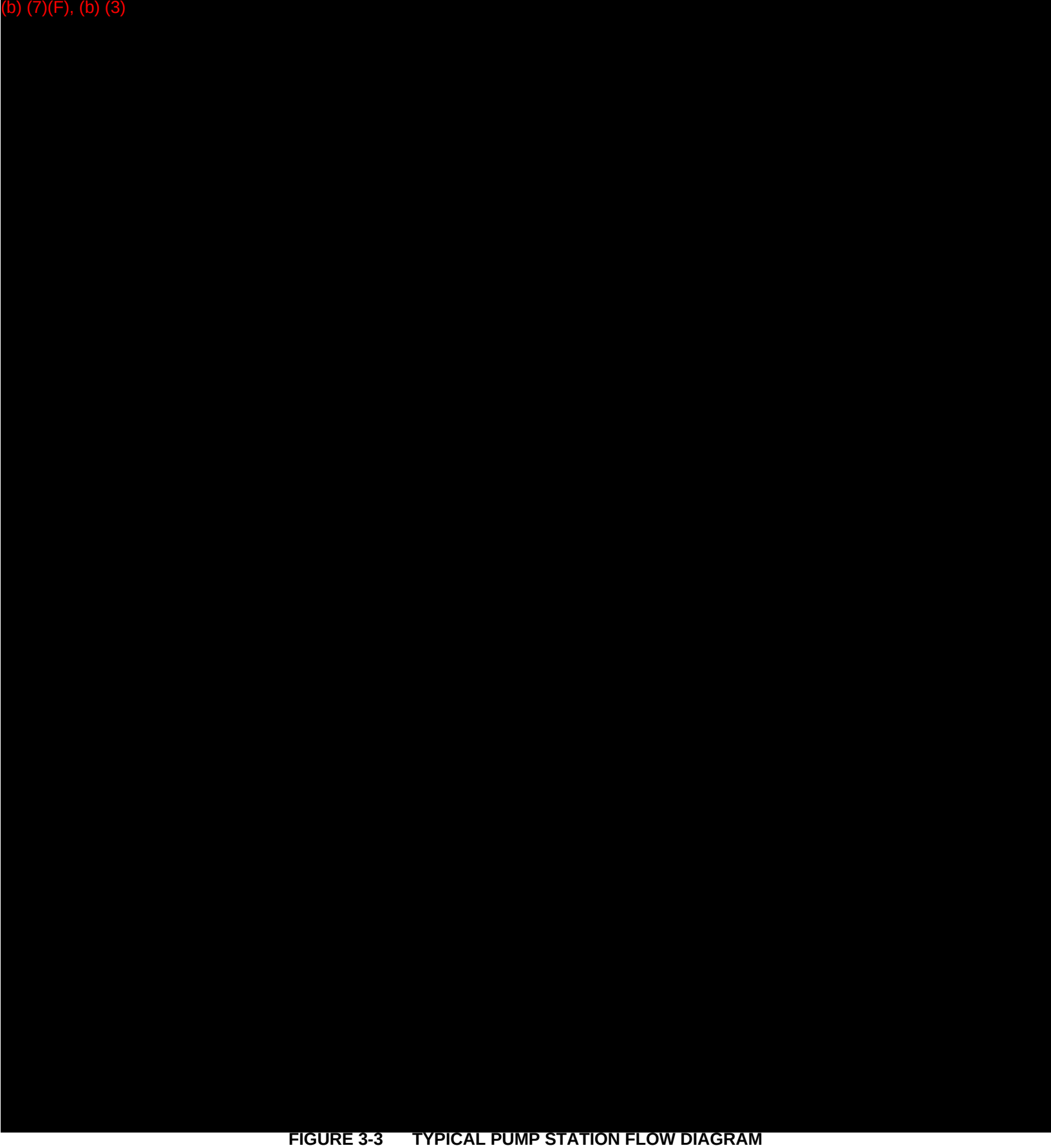


FIGURE 3-3 TYPICAL PUMP STATION FLOW DIAGRAM

3.1.7 Pressure Relief Systems

The piping pressure relief systems at the pump stations are designed to keep any combination of normal operating and surge pressures from exceeding 110% of the mainline pipe internal design pressure. There are three types of pressure relief systems at each pump station. One is on the mainline suction and discharge line, one protects equipment in case of thermal expansion, and one protects the station crude oil breakout tanks.

The mainline pressure relief system protects the mainline from overpressure and is connected to the suction and discharge sides of each pump station.

The equipment pressure relief system protects equipment and piping from being overpressurized from such causes as thermal expansion and pressure increases due to the malfunction of valves.

The tank pressure relief system protects the crude oil breakout tanks from excessive pressure or vacuum caused by thermal or inventory changes. This system consists of pressure vacuum vents located on top of each tank.

3.1.7.1 Mainline Pressure Relief

Suction pressure relief is provided by three pressure control valves with inlet piping connected to the mainline upstream of valve M1. Discharge pressure relief is accommodated by two pressure relief valves ([redacted]) with inlet piping connected to the mainline downstream of valve M2. Both relief systems discharge through a common manifold through a valve into the station crude oil relief tank.

3.1.7.2 Suction Relief Instrumentation

The suction pressure is sensed from two independent connections on the primary suction line just upstream of valve S1. The suction relief valves may be opened by either of two controllers or the pressure switch.

The PIC-003 surge controller monitors the change in suction pressure over time. It actuates the suction relief valves at the station if an increase in pressure occurs faster than the set rate-of-rise value. The controller has a constant bias above the suction pressure and reacts only to a rate-of-change in pressure regardless of suction pressure.

The PIC-004 monitors actual suction pressure. It opens the suction relief valves if the suction pressure reaches the set point. The set point for PIC-004 is controlled from OCC. PIC-004 is set at a predetermined safe value in order to protect the upstream mainline piping from overpressurizing due to surge caused by an unanticipated station shutdown.

The output signals from PIC-003 and PIC-004 are transmitted to a low-select device. The low-select device compares the signals and transmits the one that will cause the suction pressure relief valves to open if needed. A redundant pressure switch, PSH-004, fully opens all relief valves if the PIC-004 malfunctions and the suction pressure rise continues.

Minor changes in suction pressure are accommodated by changes in pump speed. Suction pressure instrument PIC-001 provides pressure information to the pump controller. This controller adjusts pump speed to accommodate changes in suction pressure, allowing the pressure relief valves to remain closed through minor pressure transients.

The station has sufficient suction relief valves for pressure relief, plus an additional valve for standby. The standby relief valve is normally online.

3.1.7.3 Discharge Relief Instrumentation

Discharge pressure is sensed from two independent connections on the 42-inch discharge line immediately downstream of valve D1. Controller PIC-005 signals the discharge relief valves to open as necessary to keep the discharge pressure from exceeding the relief set point pressure. The PIC-005 set point is normally about 50 psi above the set point for the PIC associated with pump speed control PIC-002. Indication of the control mode and set point are transmitted to OCC.

The station is designed to have enough discharge relief valves for pressure relief plus one valve for standby. The standby relief valve is normally online. A suction or discharge pressure relief valve can be independently isolated for repair or inspection.

3.1.7.4 Valves and Actuators

The suction and discharge relief valves are modulation-type control valves. On any valve, the stem is positioned by a pneumatic-powered actuator that responds to an electronic signal from an associated PIC. All suction and discharge valves receive a 4-20 milliamp (ma) signal from the PIC controller. The 20 ma signal keeps the valve closed. The valve opens proportionally as the signal drops from 20 ma.

3.1.7.5 Equipment Pressure Relief

Equipment and short sections of piping that can be overpressurized have been equipped with conventional safety valves for protection. Safety valves protect equipment and piping discharge through closed, piping drain systems into sumps.

3.1.8 Operations

Each of the stations along the pipeline has the capability of being controlled either remotely from the OCC or locally by its own station control panel. Surveillance and monitoring programs are described in *MS-31, Surveillance Manual.* Maintenance information is contained in the Preventative Maintenance Database.

3.1.8.1 Normal Operations

In the normal operating mode, most of the pump station functions are controlled by the OCC. Once in the “Automatic/Local” mode, the equipment operates without further interference and with a minimum of local attention. When in the “Automatic/Remote” mode, the equipment operates on the same locally sensed intelligence, but the setpoints are adjusted from OCC. If required, the Pipeline Controller at OCC may increase or decrease the throughput, within capacity limits, by adjusting the pressure controller setpoints.

At regular intervals, the pipeline control system monitors the status of all pump stations and valves through cyclic interrogation. All critical system data is recorded and compared against preprogrammed limits and logic to detect any out-of-tolerance alarm conditions or abnormally large changes. Alarm and control signals do not wait for the normal scan but have priority and are transmitted instantly. The Pipeline Controller at OCC can rectify any off-limit operation by changing setpoints to pump speed controllers or relief valves or issuing idle or stop commands to the mainline units (MLUs). The stations can generally be shut down within a minute.

The stations operate with local automatic fail-safe control. This control uses locally sensed intelligence based on flow rate, pressure, and temperature. All critical station equipment is fully automatic.

All main pumps at the stations can be shut down locally or from OCC by a single command. The speed of the electric drivers from the main pumps is changed in accordance with operating parameters such as line pressure. Pressure and flow controllers automatically vary the speed of the pumps to keep the pressures within preset limits.

3.1.8.2 Non-Routine Operations

Under emergency conditions, both OCC and local pump stations have the capacity to shut down the station, close RGVs, and initiate other measures to minimize a spill.

Emergency conditions will shut down a process area and isolate it, will shut down the entire pump station and isolate it from the line, or will shut down the entire pipeline. These functions are described in *DO-14-*

(b) (7)(F), (b) (3)

3.1.9 Spill Control and Prevention

It is Alyeska policy to take every reasonable action to prevent and mitigate oil spills without compromising personnel safety policies. The control of an oil spill can be viewed in four distinct phases:

- Leak detection
- Source control
- Containment and Recovery
- Restoration

3.1.10 Corrosion Monitoring and Deformation Program

The Alyeska Corrosion Monitoring and Deformation Program is discussed in detail in Section 2.1.8, “Piping Corrosion Control and Leak Detection Program.”

3.1.11 Leak Detection

Alyeska has an established network of monitoring systems and devices for surveillance of the pipeline to detect leaks or the potential for leaks. These are discussed in detail in Volume 1, Section 2.1.8, “Piping Corrosion Control and Leak Detection Program.”

3.1.12 Emergency Response Organization

The officers and other members of senior management are committed to assign any resources of the company needed for effective, prompt, and efficient response to oil spill emergencies. They ensure that government authorities and public information sources receive necessary information.

The Alyeska Incident Management Team (IMT) is organized according to an Incident Command System (ICS) to provide fast and effective response and strong follow-up capabilities for all oil spills. The activities of the IMT are under the direction of the Alyeska Incident Commander. A complete description, including organizations charts can be found in Volume 1, Section 3.3, “Incident Command System.”

3.1.13 Type and Amount of Oil

This section contains information about the type and amount of oil stored at pipeline facilities and pump stations. Pipeline throughput is estimated at 900,000 bpd for 2006.

3.1.13.1 Crude Oil

Each on-line pump station facility incorporates a crude relief tank for use in pipeline operational upsets. These tanks are designed to receive crude oil from the pipeline in the event of a pipeline rupture, blockage, or pipeline draindown. These tanks maintain various levels of oil in them to accommodate adequate coverage of the inlet header piping and to provide adequate reinjection pump suction pressures.

(b) (7)(F), (b) (3) re designed for a different purpose than other pump station crude oil relief used to receive crude oil from the various North Slope production fields. main pump units.

Volume 1, Section 2, Table 2-2 provides average volume usage for the crude oil tanks.

3.1.13.2 Diesel Fuel

Each pump station has diesel fuel tanks that provide diesel fuel for generators, station utilities, and vehicle fueling. (b) (7)(F), (b) (3) generators are fueled with natural gas.

Volume 1, Section 2, Table 2-2 provides average monthly volume usage for vertical refined fuel storage tanks.

3.1.13.3 Miscellaneous Tanks

Additional horizontal aboveground storage tanks are sited at various locations along the pipeline. These tanks are over (b) (7)(F), (b) (3) provide storage for aircraft fuel (JP-4), gasoline or diesel fuel. Table 2-2 provides average usage for horizontal storage tanks.

3.1.13.4 Material Safety Data Sheets

Material Safety Data Sheets (MSDSs) can be found on Alyeska's A-Net by the following link:

http://alyeska.complyplus.com/search/default.asp

Refer to the following MSDSs on Alyeska's A-Net:

- MSDS No. 00001392, "Alaska North Slope Crude Oil"
- MSDS No. 00000998, "Turbine Fuel"
- MSDS No. 00000748, "Jet Fuel, Grade Jet A"
- MSDS No. 00001687, "Premium Unleaded Gasoline"
- MSDS No. 00000820, "Drag Reducing Agent FLO 1003"
- MSDS No. 00000350, "Therminol"

3.1.14 Vessel Routes

Not applicable

3.1.15 Vessel Plans and Diagrams

Not applicable

3.1.16 Transfer Procedures

Alaska has developed Safe Operating Procedures (SOPs) and Operating Procedures (OPs) to cover the transfer of propane, gasoline, diesel, turbine fuel, jet fuel and drag reducing agent (DRA) at the various facilities on the pipeline. These procedures are revised and updated regularly, based on operational experience. A full discussion of these procedures is found in Volume 1, Section 2.1.5, “Transfer Procedures.”

3.2 RECEIVING ENVIRONMENT [18 AAC 75.425(e)(3)(B)]

The 800-mile trans-Alaska pipeline passes over or under more than 800 streams and rivers, stretches across rolling tundra and rugged mountain terrain, and traverses several wildlife and recreational areas. An accidental release of crude oil along the pipeline may result in an impact to the environment and the local ecology. The environmental and ecological resources which would be threatened should oil be accidentally released are reviewed in this section.

Water Resources at Risk

To minimize the potential impact of an oil release on surface water resources, the choice of valve location was optimized by evaluating such resources along the pipeline length on a mile-by-mile basis. Using field observations and engineering judgment, Alyeska identified streams based on:

- Width at mean annual flood
- Aesthetic value
- Wildlife habitats
- Hunting grounds
- Camping areas
- Uniqueness of terrain
- Sport fishing and fisheries
- Cultural features
- Areas of wildlife observation
- Geological interest
- Boating sites
- Nature study areas

The 800-mile length of the pipeline was divided into 80 unequal segments of similar traits and evaluated.

Wildlife

Animal species commonly observed along the pipeline route include:

- Black, grizzly, brown, and polar bear
- Wolverine
- Moose
- Wolf
- Mountain goat
- Dall sheep
- Bison
- Musk ox
- Caribou

Caribou and moose cross the pipeline during migration.

Several of the streams are in the bald eagle's high use zone. Other raptors have been observed along the pipeline route.

Commercial forest lands are in the areas of Sheep Creek and the Lowe, Tsina, and Tiekel rivers. The floodplain and lower terraces of the Tiekel River contain large diameter balsam poplar trees.

3.2.1 Potential Routes of Discharge [18 AAC 75.425(e)(3)(B)(i)]

Information related to the potential routes (drainage patterns) of a pipeline discharge have been mapped and are contained in Volume 4, *Map Atlas*. The *Map Atlas* shows drainage patterns on topographic maps that contain updated topographic information, and on aerial photographs. Pipeline milepost (PLMP) notations are indicated on these graphic resources and on containment site maps as a common location cross reference.

Potential and predetermined containment sites showing surrounding hydrographic, geophysical, and geographic features are presented graphically and are described in the *Map Atlas*.

Due to terrain type and/or wildlife usage, sensitive areas are also identified in Alyeska's *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*, which also provides expanded information about these subjects.

3.2.1.1 Pump Station Drainage

Pump station plot plans showing drainage patterns are contained in Volume 1, Section 1.8, "Facility Diagrams." Volume 4, *Map Atlas*, also show the pump station facilities and drainage patterns of the surrounding terrain.

Oil contamination and runoff are controlled at the pump stations with secondary containments in areas with this potential.

3.2.2 Estimate of Response Planning Standard (RPS) to Reach Open Water

Estimates of crude oil or fuel oil RPS to reach open water from a pipeline rupture or a pump station have been developed and are contained in Section 5 of Volume 1.

Directions on where to find RPS information within the Plan for each pump station can be found in Section 5 of Volume 1 with additional supporting RPS information in Section 3 of Volume 1.

3.3 INCIDENT COMMAND SYSTEM [18 AAC 75.425(e)(3)(C)]

3.3.1 Description of ICS and Unified Command

Alyeska responds to emergencies using an organization patterned after the Incident Command System (ICS). Pursuant to *The Alaska Federal/State Preparedness Plan for Response to Oil and Hazardous Substance Discharges/Releases, Unified Plan, Vol. 1*, Alyeska expects regulatory agencies and local government officials to join Alyeska's Incident Commander in forming a Unified Command. The Unified Command offers a consistent, systematic means of organizing a variety of companies and agencies into one concerted effort. The concept offers uniform and "trackable" procedures that enable all incident response organizations and oversight agencies to perform their roles effectively.

The ICS is based on commonality. Companies, agencies, and communities use the same terminology and a similar organizational structure. When working together on an incident, there is clear understanding of information and immediate knowledge of the chain-of-command.

The goals of the Unified Command are to:

- Improve the information flow and interfaces between all involved agencies
- Develop a single, collective approach to the incident, regardless of its functional or geographical complexities
- Optimize the efforts of all agencies as they perform their respective missions
- Reduce or eliminate duplicated efforts and omissions

The maintenance and operating crews based at each active pump station and response base will form Alyeska's Initial Response Teams (IRTs). The IRTs will use an abbreviated ICS structure focused on the initial mobilization and response elements of the plan. This organization is called the "On-Scene Command" group. The On-Scene Command structure is shown in Figure 3-4. It is the responsibility of the Incident Commander, in consultation with the Operations Section Chief, to evaluate the magnitude of the spill and to determine the appropriate degree of advisory and support personnel needed for the emergency. Personnel assigned to the IRT will perform response actions using available local resources. The Volume 3 provides general guidance for response actions. The Operations Section Chief will advise the Incident Commander if any additional company or outside resources are needed. Once the Plan is activated, continuous efforts will be maintained until the spilled oil is satisfactorily contained and cleaned up.

Alyeska maintains an Incident Management Team (IMT) consisting of ICS-trained individuals. Alyeska's *Emergency Telephone Book* (http://www.alyeska-pipeline.com/etb/) contains IMT (ICS) organization charts and lists individual personnel assigned specific functions (and their designated alternates). The listed positions are filled by TAPS personnel who normally have other operating responsibilities. However, in the event of an oil spill, the listed IMT duties will supersede normal responsibilities. Alyeska maintains at least four people, company-wide, to fill the job functions of Incident Commander, Operations Section Chief, Planning Section Chief, and Logistics Section Chief.

The most likely occurring oil spills will be small in volume and controlled by an IRT. Each IRT is trained and equipped to provide appropriate response to spills in accordance with the Plan. If the IRT is unable to

completely handle any spill, they will notify the Incident Commander of the situation, take actions to protect sensitive areas, and initiate what containment they can until help arrives. The Incident Commander will marshal additional personnel and equipment from within his/her jurisdiction and/or call on a tiered response to activate as much equipment and personnel from other pipeline facilities as necessary. This will include activation of the IMT.

Alyeska's response organization is divided into five functional areas:

1. Command
2. Operations
3. Planning
4. Logistics
5. Finance

The IRT positions will normally be staffed by Alyeska operating and maintenance personnel located in the field. Along with providing response to oil spills within assigned locations, they will also be available for assistance in other locations, as directed by the Incident Commander. Figure 3-4, Figure 3-5, and Figure 3-6 show examples of an ICS response organization for small and large spills.

3.3.2 Description of Rapid Response Team ("Go Team")

As part of the Incident Management Team, Alyeska maintains a highly trained Rapid Response "Go Team" in Fairbanks. This team's primary duties are to respond to the scene of a spill at the earliest possible time, staff the Mobile Command Post, support the On-Scene Command organization, and provide real time status briefings and information to the IMT. The "Go Team" is organized under the ICS system and consists of field-based Unit Leader positions with the same job duties as their IMT counterparts. "Go Team" members will normally augment the On-Scene Command Organization (Figure 3-4) and fill field-based Unit Leader, Staging Area Manager, and Operations Section (OPS, Dept. OPS, TFL) positions as needed during the extended response phase of an incident. During a Source Control & Repair event the "Go Team" and the MCP will support the SC&R Team as well.

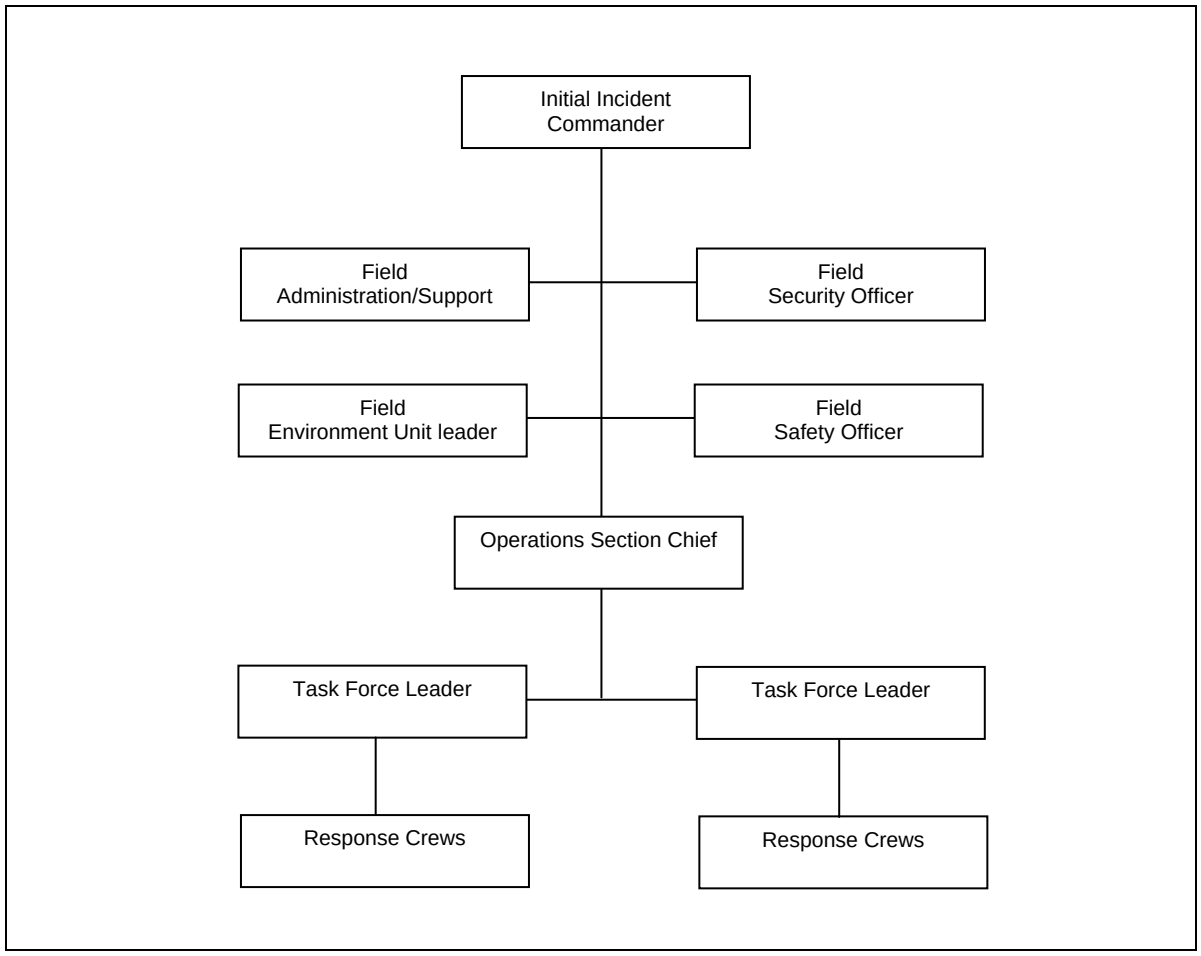


FIGURE 3-4 INITIAL RESPONSE – ON SCENE COMMAND ORGANIZATION

Extended response with “Go Team” organization staffed is presented in Figure 3-5, and presents Field ICS organization which would consist of adjacent pump station personnel, “Go Team” members, and the original On-Scene Command pump station personnel a few hours after the initial response when the IMT has Command & Control of the Incident and the Mobile Command Post is at the scene.

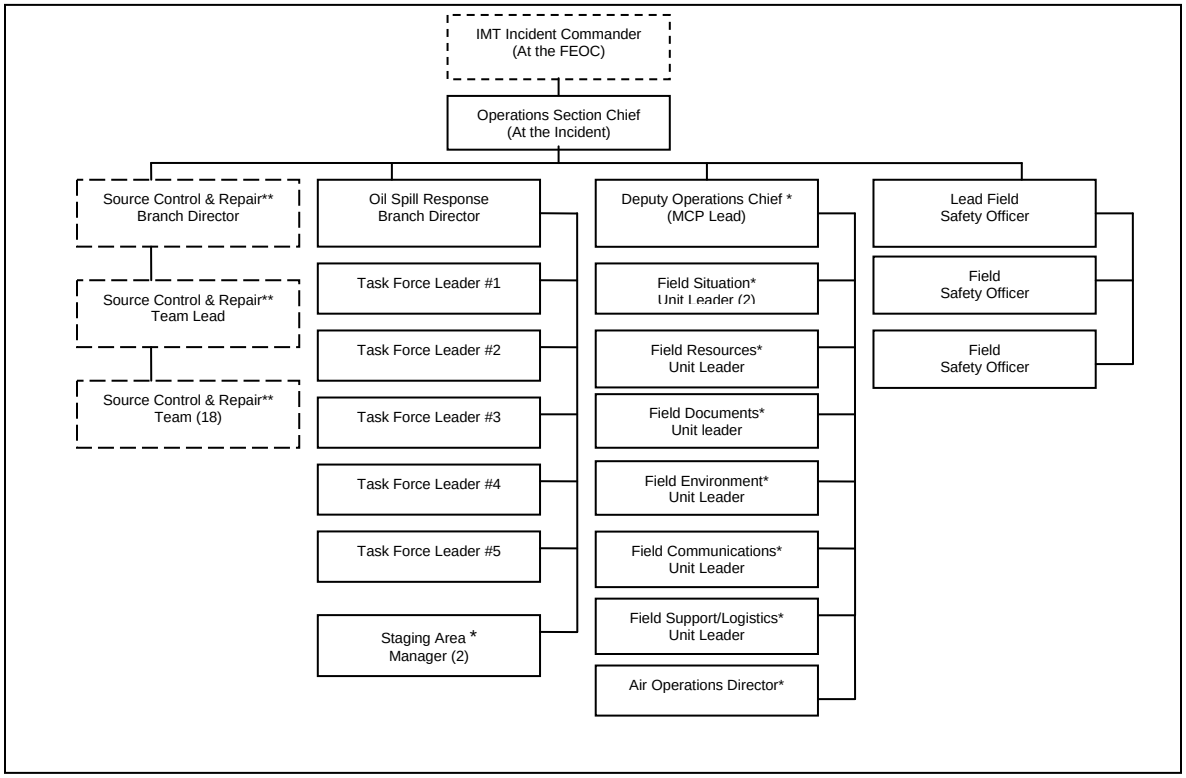


FIGURE 3-5 EXTENDED RESPONSE WITH “GO TEAM” ORGANIZATION STAFFED

Notes:

* Rapid Response Team “Go Team” who staff the Mobile Command Post

** Source Control & Repair Team Organization when activated

Incident Management Team

Notes:

1. Under ICS, one person may handle one or several roles.

2. The nature of the ICS structure is such that over time the size of the organization can readily expand or contract according to actual conditions. In a large spill scenario, personnel may arrive on scene from Anchorage or other locations, if necessary.

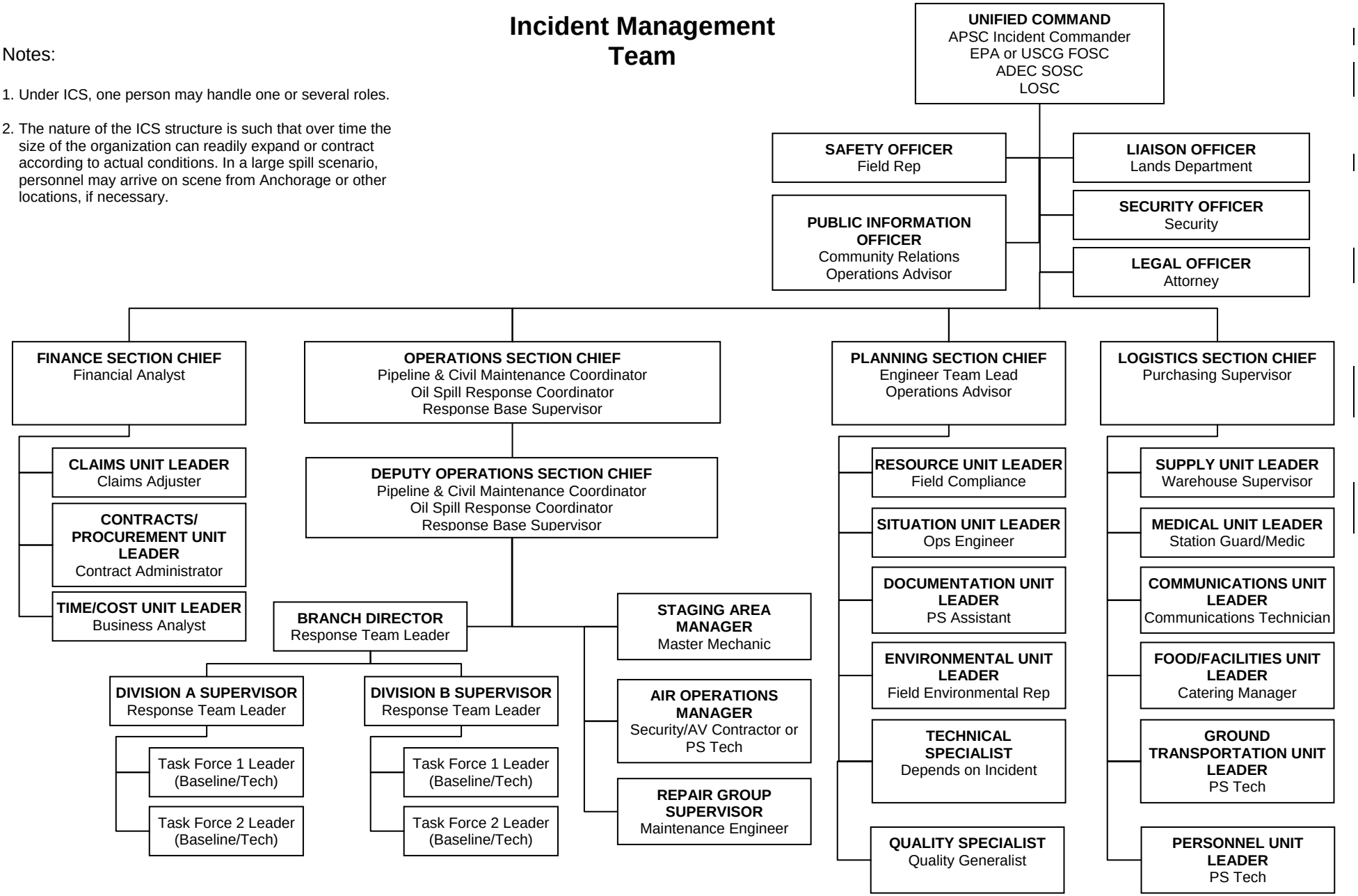


FIGURE 3-6 RESPONSE ORGANIZATION – INCIDENT MANAGEMENT TEAM

3.3.3 Command Section

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Incident Commander	Responsible to the President and CEO for three functions: • Strategic control and management of all company-initiated efforts related to an oil spill contingency. • Ensures that company resources are used in a safe, effective, and environmentally acceptable manner. • If the line has been shut down, restores the line to service as soon as possible in accordance with the aforementioned function.	• Pipeline Manager • Vice President • Incident Management Team (IMT) • P&CM • OC • Maintenance Supervisor • RBS	• Review and update the *Pipeline Oil Discharge Prevention and Contingency Plan* to ensure roles and responsibilities of the Incident Commander are understood and correct. • Ensure equipment is kept in a state of readiness. • See that training of personnel is conducted frequently, including periodic full-scale field exercises in accordance with the National Preparedness for Response Exercise Program (NPREP).
	Functions During an Incident		
	In coordinating function (1) above, arrange for the provision of advisory and support functions, as well as personnel and equipment needed by the Operations Section Chief, who will be responsible for the tactical handling of the oil spill. • Obtain Incident Briefing from the Initial Response Incident Commander. • Ensure that the Vice President has been notified and reconnaissance/preliminary containment actions are under way. • Based on information from the spill site, assess magnitude of the spill and activate other members/sections of the pipeline and Incident Management Team (IMT) as necessary and fill Command staff positions. • Establish Command Post at the closest Emergency Operations Center (EOC). • Establish Incident Goals and Objectives with Unified Command. • Manage incident operations. • Coordinate agency and local input on each shift objective and Incident Action Plan approval. • Inform Alyeska management of magnitude of spill and actions taken. • Ensure that thorough records and a log of all occurrences and actions are maintained by the Recording Secretary. • Prepare and conduct initial briefing and shift briefings. • Brief the Command and appropriate staffs. • Ensure a fax copy of the completed "Initial Incident Briefing" package (Form ICS 201) is sent to the supporting EOCs. • Verify that planning meetings are conducted for each planning period. • Determine information needs and inform Command personnel of such needs. • In the event of a large spill, verify that emergency shutdown procedures have been initiated by the Pipeline Controller. Assist the Pipeline Controller in determining whether it is necessary to shut down the pipeline on a marginal spill. • Coordinate staff activity. • Approve requests for additional resources and requests for release of resources. • Review and authorize release of information to the news media. • Approve plan for demobilization. • Maintain a manageable span of control. • Maintain a "Unit Log" (Form ICS 214) throughout the response.	

3.3.3 Command Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Verify that safety precautions are being taken throughout the response. • Attend required meetings. • Review and approve press briefings. • Verify that agency on-scene coordinators are satisfied with the progress of the Unified Command. • Ensure that Section Chiefs are advised of any changes or needs. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Deputy Incident Commander	Same responsibilities and actions as Incident Commander (see above).		
Legal Officer	Responsible for providing legal/guidance on all aspects of an oil spill incident.	• Associate General Counsel or his/her designee • Alternate: General Counsel	• Review and update the *Pipeline Oil Discharge Prevention and Contingency Plan* to ensure information is relevant to potential legal actions. • Advise Incident Commander and personnel of necessary records and documentation. • Advise the company regarding changes in oil spill regulations and/or legislation, both federal and state, promulgated by government agencies.
	Functions During an Incident		
	• Provide legal assistance as requested by the Alyeska Incident Commander. • Provide and give legal approval of oil spill reports to government agencies prepared by the Alyeska Incident Commander or his/her designee. • Ensure that relevant information is being gathered and preserved. • Help resolve land ownership and pipeline right-of-way (ROW) issues. • Work closely with Documentation Unit to ensure that documentation collected meets regulatory requirements. • Review and approve press briefings and releases. • Receive incident briefing from the Incident Commander and obtain: - "Initial Incident Briefing" package (Form ICS 201) prepared by the Incident Commander - Incident organization chart - List of legal issues needing attention - Special instructions from the Incident Commander - The current Incident Action Plan (IAP) • Ensure that the Vice President has been notified and reconnaissance/preliminary containment actions are under way. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.3 Command Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Public Information Officer	Responsible for public relations support to the Incident Commander. Formulation and release of information about the incident to the news media and other appropriate agencies and organizations.	• Field Public Relations Personnel • Manager of Corporate Services and his/her support staff	• Review and update the *Pipeline Oil Discharge Prevention and Contingency Plan* for familiarization and accuracy. • Keep news media informed of status of Alyeska's contingency plans.
	Functions During an Incident		
	• Prepare news releases for approval by the Alyeska Incident Commander/Unified Command and Alyeska Management. • Keep Alyeska management informed of response status and areas of concern through Alyeska's Emergency Operations Center (EOC) in Fairbanks and Valdez. • Press releases must be approved by the Incident Commander and should include the following information as it becomes available: - Description of spill incident, including quantity and areas affected. - Description of cleanup measures undertaken and planned. - Details of special efforts taken to protect environmentally sensitive areas. - Names of consultants and specialists on-scene to assist in cleanup activities. - Specific names of individuals and organizations who provide assistance (fire departments, police units, civil defense, etc.). • Obtain approval for information release from the Incident Commander and Legal Officer. • Release news to news media; post information in the EOCs and other appropriate locations. • Maintain a close working relationship with all news media, government agencies, conservation groups, and civic and public organizations; make arrangements for on-site inspection by reporters and others. • Contact the public affairs section at the Bureau of Land Management (BLM), Alaska Department of Natural Resources (ADNR), and Alaska Department of Environmental Conservation (ADEC) to coordinate public information activities. • Establish a single incident joint information center. • Arrange for necessary work space, materials, telephones, and staffing. • Obtain information on current status of containment efforts. • Prepare an initial information summary as soon as possible after arrival. • Observe guidelines on the release of information imposed by the Incident Commander. • Prepare "fact sheets" on information relating to the oil spill as needed. • Attend planning meetings and briefings to update information released. • Arrange for meetings between media and incident personnel. • Provide escort service to the media and VIPs for on-site inspections (coordinate with Liaison Officer). • Respond to special requests for information. • Obtain briefing from the Incident Commander. • Under Unified Command, contact Federal On-Scene Coordinator (FOSC) and State On-Scene Coordinator (SOSC) public affairs section to coordinate public information activities. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.3 Command Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Safety Officer	• Responsible for planning and endorsement of necessary safety and personnel protective equipment (PPE). • Arrange for any special traffic or personnel control required in the spill area. • Provide guidance to all departments relative to safety regulations.	• Safety/Industrial Hygiene (S/IH) Specialist • Corporate Fire and Safety Manager • Technician	• Review and update the *Pipeline Oil Discharge Prevention and Contingency Plan* and recommend changes needed to improve safety. • Ensure that all oil spill personnel are informed of safety requirements. • Keep the field personnel up to date on personnel protection requirements and availability of first aid and medical services. • Conduct routine surveys of all oil spill activities to ensure that proper safety precautions are being observed by personnel. • Review training and field drills from a safety standpoint and incorporate needed safety training.
	Functions During an Incident		
	• Advise Operations personnel on personal protection requirements based on working and weather conditions in the area. • Respond to incident site with gas detector to determine proper personal protective equipment required for response personnel. • Secure the area. • Establish hazard control zones and decontamination area. • Conduct Safety briefings. • Conduct inspection of incident site and all other sites. • Prepare and issue "Health and Safety Message" (Form ICS 223). • Ensure distribution of PPE. • Ensure special handling of traffic and personnel in specific spill and staging areas complies with applicable safety requirements. • Monitor activities at the scene of spill as needed. • Obtain briefing from the Incident Commander. • Identify hazardous situations associated with the incident. • Participate in Planning, Status, and Tactics meetings, and incident and shift briefings. • Review the Incident Action Plan (IAP). • Identify potentially unsafe situations. • Prepare the safety plan(s) for each shift as required. • Ensure responders have proper HAZWOPER certification before being dispatched to the incident site. • Ensure that incident personnel are informed of safety requirements. • Exercise emergency authority to stop and prevent unsafe acts. • Investigate accidents that have occurred within the incident area. • Review and approve the "Medical Plan" (Form ICS 206).		

3.3.3 Command Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Review the "Site Safety and Control Analysis" (Form ICS 201-5) prepared by the Initial Response Incident Commander. • Ensure emergency radio frequencies have been identified and made known to all incident personnel. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Liaison Officer	• Responsible to the Alyeska Incident Commander for ensuring that government agencies are kept informed of any oil spill incident activities. • Maintain liaison between local, state and federal government agencies, special interest groups, and the Alyeska Incident Commander. • Relieve the Incident Commander of as much government liaison work as practical so that he/she can devote full attention to oil spill containment and cleanup.	• Assigned field personnel • Lands/Permit Coordinator • Civic Liaison	• Review and update the *Pipeline Oil Discharge Prevention and Contingency Plan* to ensure civic and governmental liaison procedures are defined. • Coordinate contact procedures and details with key governmental agencies to provide communications during emergencies. • Arrange for involvement of civic and government agencies in oil spill exercises.
	Functions During an Incident		
	• Advise or request assistance of other government agencies as circumstances dictate. • Communicate with potentially impacted communities. • Coordinate governmental aspects of press releases, working with Alyeska Incident Commander and Public Information Officer. • Ensure that the Operations Control Center (OCC) has notified the United States Coast Guard (USCG) of any spill in waters of the United States. • Obtain briefing from the Incident Commander • Provide a point of contact for government representatives. • Identify representatives from each agency including location and appropriate communications link. • Respond to requests from incident personnel for inter-organizational contacts. • Monitor incident operations to identify current or potential inter-organizational problems. • Ensure agency representatives are informed of activities. • Attend any or all meetings. • In cooperation with the Documentation and Environment Unit Leaders, the Liaison Officer will record contacts with and directives from regulatory agencies. • The Liaison Officer will also collect copies of all permits obtained for specific operations which are subject to regulations such as disposal of oil materials, utilization of government owned equipment, access to land, and utilization of chemical agents. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.3 Command Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Security Officer	Responsible for security services and assistance as required by circumstances relating to any oil spill.	• Nearest Security Sergeant • Manager, Security • Security Supervisor	• Review and update the *Pipeline Oil Discharge Prevention and Contingency Plan* to ensure Security's roles are correctly defined. • Develop and maintain contact with local and state law enforcement agencies. • Keep above-mentioned agencies apprised of the *Pipeline Oil Discharge Prevention and Contingency Plan* and emergency telephone contacts.
	Functions During an Incident		
	• Coordinate security measures at the spill site and limit access to authorized personnel only. • Obtain briefing from the Incident Commander. • Notify guard of contact number and have guard initiate the weather report (MPS Format 928023). If sabotage is suspected, take the appropriate actions in accordance with standard procedures. • Notify Anchorage Security and request Corporate Security to activate the major incident plan for the area. • Notify respective Alyeska Linewide Security Supervisor to request additional support if needed. • Request additional guards and equipment as needed. • Establish communications to keep the Emergency Operating Center (EOC) aware of status of all security actions. • Brief field Security Supervisor, Alyeska Corporate Security and Security Contractor Corporate Officers. • Protect the scene and notify local law enforcement agencies, if major injury or fatality occurs. • Assist with response personnel check-in at sites. Coordinate with Resource Unit Leader. • Inform and request assistance from the local law enforcement, State Troopers, or city police as required by circumstances relating to the oil spill • Notify State Troopers and request that the Bureau of Alcohol, Tobacco, and Firearms be notified if explosion or fire is experienced with any oil spill. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.4 Operations Section

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Operations Section Chief	• The Operations Section Chief is responsible for management of all tactical operations directly affecting the oil spill and for the formulation of the tactics necessary to contain the oil spill. This position reports directly to the Incident Commander. • Coordinates tactical operations at the incident, including all activities directed towards reducing the immediate hazard, establishing situation control, and restoring normal pipeline operations. Directs activities of the cleanup efforts. Coordinates the activities of major contractor groups supplying a labor force and supervises their deployment of resources. Assist in the formulation of the Incident Action Plan (IAP) and directs its execution.	• P&CM or OC • Alyeska Supervisor • Project Supervisor • Operations personnel and contractors	• Review and monitor equipment. Provide for handling and training for oil spill response personnel. • Monitor emergency response training and drills conducted in accordance with the *Pipeline Oil Discharge Prevention and Contingency Plan.* Be familiar with the OSCP for the pipeline. • Monitor the operational readiness and maintenance of the equipment and supplies required for containment exclusion and clean-up.
	Functions During an Incident		
	• Contact the Incident Commander and give a briefing on initial work activities in progress and resources dispatched to the incident. • Obtain incident briefing from the Incident Commander. • Contact Baseline Contractor Foreman to develop initial tactics based on the Initial Site Assessment Report. • Convey current information on spill response status to the Planning Section Chief in time for completion of the planning cycle for a significant spill. • Ascertain the nature of the oil spill, evaluate the effectiveness of current actions, and order additional resources as needed. • Determine areas requiring maximum effort and assign resources as necessary. • Provide progress reports to Alyeska Incident Commander on containment and cleanup activities. • Assign individuals to fill staff positions as needed. • Supervise operations. • Establish staging areas, as necessary. • Identify resources not needed for operations during demobilization. • Attend and/or give presentations at meetings, as necessary. • Maintain highest level of safety awareness in the field. • Identify air operational needs. • Complete "Initial Incident Briefing" package (Form ICS 201), "Operational Planning Summary" (Form ICS 215), and "Supply/Materials Request" (Form ICS 222). • Verify the "Medical Plan" (Form ICS 206) for each Division/Group under development. • Initiate permit activities as required in the OSCP. • Direct establishment of decontamination centers. • Meet with Security and designate area control points. • Ensure Fire/Safety Officer (SO) is on site.		

3.3.4 Operations Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Gather necessary plans, maps and forms for initial incident briefing. • Appoint Radio Operator. Brief as to what the responsibilities of this position are. • Contact Mutual Aid Partners if applicable. • In a Large-Scale Operation: - Conduct an operational briefing for Branch Directors, Division/Group Supervisors, and other assigned operational personnel on the Incident Action Plan (IAP). Obtain feedback for input in planning the next operational period. - Maintain surveillance of oil spill movement and deploy exclusion booms, as necessary, to protect environmentally sensitive areas. - Maintain close communications and liaison with on-site governmental authorities through the Liaison Officer. - Develop the tactical operations portion of the IAP and communicate this information to the Planning Section Chief. - Brief and assign supervisory operations personnel in accordance with the IAP. - Assemble and disassemble Task Forces/Strike Teams assigned to Operations Section. - Review operational control activities to maintain a manageable span of control. - Establish and maintain staging areas and identify required locations, expected number and type of resources, and estimate duration for use of each area. - Coordinate with the Logistics Section Chief for needed services and support. - Initiate recommended release of resources for demobilization by type, quantity, location, and time they become surplus to needs of the incident. - Establish a process for recovery, treatment, and eventual release or disposal of oiled wildlife. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Operations Liaison	• The Operations Liaison is normally located at the Fairbanks Emergency Operations Center (FEOC) and acts as the liaison and coordinator between the Operations Section Chief located in the field and the Incident Management Team (IMT). • The Operations Liaison will have the same training as the Operations Section Chief.	• Maintenance Supervisor • Oil Spill Coordinator (OC) • Senior Operations Manager • P&CM • RBS	• Obtain briefing from the IMT Incident Commander. • Coordinate with the Operations Section Chief in the field for development of the Operations portion of the Incident Action Plan (IAP). • Ensure completion of "Task Force Assignment," Form ICS 204-1, during the first half of the shift for input into the "Operational Planning Summary," Form ICS 215. • Present the "Operational Planning Summary" form (ICS 215) at the tactics meeting at the end of the first half of the work shift. • Finalize the "Operational Planning Summary" form (ICS 215) with the Logistics Section Chief and Resource Unit Leader at the planning meeting.
	Functions During an Incident		
	• Represent the Operations Section at all IMT meetings and briefings.		

3.3.4 Operations Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Attend shift briefing at the end of the shift and transmit the IAP to the On-Scene Command. • Attend and/or give presentations at meetings as necessary to represent Field Operations interests. • Ensure Fire and Safety Officer (SO) are on site or enroute. • Convey current information on spill response status to the Planning Section per requests and the planning cycle • Through the Liaison Officer, closely communicate and liaise with onsite government authorities. • Coordinate with the Logistics Section Chief for needed services and support. • Review the IAP Tactics with the Operation Section Chief. • Maintain a constant dialog with the Operations Section Chief on the progress of the incident. • Ensure the IAP is distributed to the field prior to the field shift briefing. • Prepare and maintain the "Unit Log," Form ICS 214, throughout the response. • Ensure all appropriate documentation is prepared and submitted to the Documentation Unit Leader at the end of shift or incident response. • Brief counterpart before going off shift • As necessary, use Form ICS 213, "General Message/Resource Request."		
Staging Area Manager	Staging areas are locations designated by the Operations Section Chief within the vicinity of the oil spill that are used to temporarily locate resources that are available for tactical assignment. The Staging Area Manager is responsible to the Operations Section Chief for managing all activities within a staging area.	Assigned Field Personnel	Review Volume 3 for potential staging area locations (material sites, airports, construction, camp pads, laydown yards, etc.).
	Functions During an Incident		
	• Obtain incident briefing from the Incident Commander • Establish, move and discontinue staging areas as specified by the Operations Section Chief; maintain staging area in orderly condition. • Post areas for identification and traffic control. • Request logistical support from appropriate Logistics Section Unit (i.e., fuel, food, sanitation, communications equipment) as required to support the staging area. • Notify Operations Section Chief when minimum levels are reached so he/she can determine whether to restock or leave as is. • Establish staging area check-in procedures and area layout. • Request maintenance service for equipment at staging area. • Demobilize staging area in accordance with incident demobilization plan. • Obtain and issue receipts for radio equipment or other supplies that are distributed and received at the staging area. • Report resource status changes to the Resource Unit Leader. • Respond to requests for resources from the field. Place appropriate order through Supply Unit Leader. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.4 Operations Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Air Operations Manager	Responsible for dispatching aircraft to transport personnel and equipment, and to perform surveillance activities in response to oil spills.	Aviation Contractor Supervisor	• Establish minimum safety criteria. • Develop company plan for emergency aircraft charter. • Keep current on runway conditions and capabilities of all airports and emergency airstrips in the vicinity of the pipeline.
	Functions During an Incident		
	• Obtain incident briefing from the Incident Commander. • Ensure that contract aircraft are maintained in proper working order. • Ensure contract aircraft are crewed by qualified crews. • Determine status of existing aircraft. • Arrange for additional aircraft support for surveillance and response to spills. • Maintain records showing each aircraft's takeoff and landing requirements and cargo-carrying capabilities. • Activate fixed- and rotor-wing contractors as necessary. • Maintain daily records of all aircraft utilization. • Maintain records indicating aircraft fuel and maintenance requirements during an emergency. • Request declaration (or cancellation) of restricted air space area through the Federal On Scene Commander, who will contact the Federal Aviation Agency (FAA) for this activity. Reference "Air Space Considerations for Incident Response" procedures. • Report air related incidents/accidents. • Arrange for an accident investigation team for aircraft related incidents, when warranted. • Coordinate with the FAA and National Weather Service (NWS) as necessary. • Update air operations plans. • Perform operational planning for air operations. • Organize preliminary air operations. • Participate in preparation of the Incident Action Plan (IAP). • Determine coordination procedures for use by air organization with branches or groups. • Coordinate with appropriate Operations Section personnel. • Supervise air operations activities with Alyeska and cooperating government agencies as requested. • Verify logistic activities are adequate to support planned air operations. • Establish procedures for emergency reassignment of aircraft. • Report to the Operations Section Chief on air operations activities. • Notify Alyeska Security in Anchorage of activities. • Set up air to air and air to ground communications channels with Communications Unit Leader. • Ensure safety of crew and passengers. • Allocate existing aircraft as prioritized by Operations Section Chief. • Ensure availability of fuel at staging areas or fuel depots. • Ensure that hazardous material declaration forms are available. • Complete "Air Operations Summary" (Form ICS 220) and "Supply/Materials Request" (Form ICS 222). • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.4 Operations Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Branch Director	Responsible to the Operations Section Chief for on-scene coordination and operation of containment, exclusion, and cleanup operations within the assigned Branch.	• Assigned field personnel • P&CM or OC • RBS	• Monitor and review the training conducted for personnel assigned to handle oil spill equipment. • Be familiar with the Pipeline Oil Discharge Prevention and Contingency Plan. • Monitor and review the maintenance, availability, and operational condition of equipment and supplies required for containment, exclusion and cleanup activities.
	Functions During an Incident		
	• Obtain incident briefing from the Operations Section Chief. • Brief Division/Group Supervisors on the Incident Action Plan (IAP). • Develop alternative plans with subordinates for branch control operations. • Attend planning meetings at request of Operations Section Chief, if available. • Resolve reported logistic problems. • Ensure that equipment and supplies required for containment, exclusion, and cleanup activities are maintained in operational condition during spill activities. • Ensure safety of all personnel assigned to this position. • Ensure that personnel are properly trained to handle equipment required. • Provide IAP to Task Force Leaders and Strike Teams. • Submit situation and resource status information to Operations Section Chief. • Participate in development of plan for next operational period. • Verify availability and location of necessary equipment to pick up oil, such as shovels, barrels, plastic bags, vacuum equipment, sorbent materials, gloves, etc. • Direct containment efforts at specified sites or develop new sites as circumstances indicate. • Provide overall supervision of assigned Task Force(s)/Strike Team(s) and distribute personnel and equipment to support efficient operations. • Establish cleanup procedures, as necessary, within a contingency area and oversee containment, exclusion, and cleanup activities within the area. • Keep the Operations Section Chief advised as to progress and suggested plan changes. • Provide technical advice on containment and cleanup to Operations Section Chief. • Coordinate disposal of recovered oil and oil-contaminated materials in accordance with an approved disposal plan. • Maintain communications schedule with the Operations Section Chief. • Maintain records of actions taken. • Approve accident and medical reports originating within the Branch. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.4 Operations Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Division/Group Supervisor	Each Division or Group Supervisor is responsible for: • Implementation of their assigned portion of the Incident Action Plan (IAP) • Assignment of resources within the division/group • Reporting on progress in their division/group • Status of resources within the division or/group The Division or Group Supervisor reports to the Branch Director. In the event that the Branch Directors are not activated, this person reports to the Operations Section Chief.	Assigned field personnel	
	Functions During an Incident		
	• Obtain incident briefing from the Incident Commander or Operations Section Chief. • Implement IAP for division/group. • Provide IAP to Task Force Leaders and Strike Teams. • Identify resources assigned to the division/group. • Review division/group assignments and incident activities with subordinates; assign tasks. • Ensure that Resource Unit is advised of all changes in status of resources assigned to the division/group. • Coordinate activities with adjacent division/groups. • Determine need for assistance on assigned tasks. • Submit situation and resource status information to Branch Director or Operations Section Chief. • Resolve logistics problems within the division/group. • Participate in the development of plans for the next operational period. • Ensure that Section Chief's advise you of any changes or needs they may have. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Task Force/Strike Team Leader	• Apply personnel and equipment to assigned Task Force/Strike Team as directed by the Incident Action Plan (IAP) and immediate supervisor. • Report progress, status, and other information to a Division/Group Supervisor. • Maintain work records on personnel.	• Technicians • Baseline Contractor • Response Action Contractor	
	Functions During an Incident		
	• Obtain thorough briefing from Division Supervisor before start of shift. • Direct contractor/Alyeska workers in containment/exclusion/recovery tasks.		

3.3.4 Operations Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Confer with the immediate Incident Command System (ICS) Supervisor frequently regarding effectiveness of efforts, personnel/equipment requirements, and procedures. • Coordinate activities with adjacent Task Forces and single resources. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.5 Planning Section

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Planning Section Chief	Assist the Operations Section Chief in assessing and assigning the work for the next shift of spill response workers.	• Maintenance Supervisor (MS) • Incident Management Team (IMT) Unit Leaders and staff • RBS	• Become familiar with the environmental characteristics of the area and its ecologically sensitive areas. • Be familiar with the Pipeline Oil Discharge Prevention and Contingency Plan.

Functions During an Incident

- Obtain incident briefing from the Incident Commander.
- Provide periodic prediction on incident potential, risks, and hazards.
- Identify need for use of specialized resources and permits.
- Ensure availability of current information on the oil spill response from Operations and Logistics.
- Ensure that the proper section spill response documentation is completed.
- Alert and brief Unit Leaders of the oil spill emergency and activate them as necessary to support operational needs.
- Establish a weather data collection system for input into the "Inland Situation Status Summary" (Form ICS 209).
- Organize Planning Section immediately following activation.
- Establish the planning cycle with strict planning timelines for strategy, planning and team meetings to facilitate the Incident Action Plan (IAP) for each operational period.
- Schedule, organize, and facilitate meetings.
- Supervise the preparation of the IAP for each planning cycle.
- Ascertain the critical nature of the spill and begin surveillance and trajectory estimates, as necessary. Provide periodic predictions on oil spill potential, resources at risk, and possible hazards.
- Develop alternative strategies using information supplied by technical specialists and operations personnel.
- Determine from Operations Section Chief which Task Force/Strike Teams will be assembled, their location, and their Task Force/Strike Team Leader.
- Identify need for use of specialized resources.
- Compile and display oil spill status information in a common location in the Incident Command Post.
- Prepare, distribute and document Incident Commander orders and identify organizational elements responsible for executing those orders.
- Oversee general welfare and safety of Planning Section personnel.
- Ensure long-term planning is accomplished for the projected duration of the incident.
- Complete/review:
  - "Incident Briefing" package (Form ICS 201)
  - "Incident Action Plan, Incident Objectives"(Form ICS 202)
  - "Incident Action Plan, Organization Assignment List" (Form ICS 203)
  - "Incident Action Plan, Division/Group Assignment List" (Form ICS 204)
  - "Incident Radio Communications Plan" (Form ICS 205)
  - "Operational Planning Summary" (Form ICS 215)
  - "Health and Safety Message" (Form ICS 223)
  - "Environmental Unit Summary Sheet" (Form ICS 224)
- Provide a written narrative of the Incident.
- Maintain a "Unit Log" (Form ICS 214) throughout the response.

3.3.5 Planning Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Situation Unit Leader	• Track the size, location, and direction of the oil spill as necessary. • Project the movement of the oil spill during each 12-hour shift as necessary.	• Assigned field personnel • Maintenance Supervisor (MS) or P&CM or OC • RBS	• Plan the implementation of display techniques suitable for the appropriate Emergency Operations Center (EOC). • Be familiar with the Pipeline Oil Discharge Prevention and Contingency Plan.
	Functions During an Incident		
	• Obtain incident briefing from the Incident Commander. • Report to and receive briefing from Planning Section Chief on status of the oil spill. • Establish a situation status board. • Prepare and maintain command post displays. • Collect all incident related data at earliest possible opportunity and continue for duration of incident. • Obtain and analyze infrared data, aerial photographs, and video tapes as applicable. • Post data on unit work displays at scheduled intervals or as requested by the Planning Section Chief. • Participate in incident planning meetings as required. • Prepare the "Inland Situation Status Summary" (Form ICS 209) before each planning meeting. • Provide photographic services and maps for the Incident Command Post. • Provide resources and situation status information for the entire oil spill in response to specific requests. • Maintain Situation Unit records. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Environmental Unit Leader	• Responsible to the Alyeska Incident Commander and the Planning Section Chief for advice and direction on environmental aspects of oil spill and cleanup procedures. • Responsible for coordinating the treatment, recovery, and eventual release or disposition of oiled birds and other animals, and the protection of environmentally sensitive waters and fish therein with the State of Alaska Department of Fish and Game (ADF&G), and the US Fish and Wildlife Service (USFWS). • Responsible for coordinating the deterrence (hazing) of unoiled wildlife from the spill site as well as the collection, management, and disposition of oiled carcasses with guidance from the resource agencies. • Responsible for direction and	• Environment Team Lead • Environmental Coordinators (ECs) • Environment Unit personnel • Wildlife Specialists	• Coordinate specialized wildlife capture training of field personnel working with International Bird Rescue Research Center (IBRRC). • Make advanced contingency arrangements for emergency employment of wildlife cleaning and rehabilitation experts and equipment. • Become familiar with the land and vegetation characteristics along the pipeline and routes of access to containment sites. • Be thoroughly familiar with the contents of the oil spill plan relating to recovery, cleanup, and disposal and restoration. • Keep current on new developments in land and vegetation restoration. • Ensure sampling programs are established to document

3.3.5 Planning Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	advice as to which cleanup methods are likely to cause the least environmental damage to the land and vegetation. Recommend procedures and practices to be employed after cleanup to restore affected areas.		baseline environmental conditions.

Functions During an Incident

- Report to and receive briefing from Planning Section Chief.
- Arrange for on-site participation and guidance of qualified specialists as needed.
- Coordinate efforts of contractor specialists to organize volunteers to help collect and rehabilitate birds and other animals.
- Record contacts with and directives from regulatory agencies with the assistance of the Liaison Officer and Documentation Unit Leader.
- Collect copies of all permits obtained for specific operations that are subject to regulation such as disposal of oil materials, utilization of chemical agents.
- Fill out "Environmental Unit Summary Sheet" (Form ICS 224).
- Implement the Environmental Response Checklists. Priorities must be assessed at time of incident based on time of year, conditions, wildlife populations and status, permitting needs, and environmental sampling and damage assessment needs.
- Maintain a "Unit Log" (Form ICS 214) throughout the response.
- Turn all original documentation in to Documentation Unit Leader at end of each shift.
- Obtain necessary environmental permits required to complete the work.
- Give counterpart briefing before going off shift.

Other Functions Include:

- Wildlife Response
  - In cooperation with ADF&G and USFWS, coordinate with qualified personnel the retrieval, cleaning, and rehabilitation of oiled birds and other wildlife. Approval and permits for wildlife deterrence, capture or treatment program must be received from appropriate federal and state trustee agencies.
  - Arrange for noise devices, as necessary, to assist in repelling (hazing) birds and other wildlife from oil-contaminated areas, in cooperation with USFWS and ADF&G.
  - Coordinate the assistance that Alyeska may provide to USFWS and ADF&G in the collection, management, and disposition of oiled carcasses.
  - Keep the Operations Section Chief and the Public Information Officer informed of the number of affected animals and progress with their rehabilitation.
  - Advise the Operation Section Chief of environmentally sensitive waters requiring special precautions to prevent damage to fisheries.
  - Call up wildlife contractors as necessary to capture and clean oiled wildlife.
  - Arrange for and monitor wildlife protection and treatment plans and programs.
  - Maintain a "Unit Log" (Form ICS 214) throughout the response.
  - Turn all original documentation in to Documentation Unit Leader at end of each shift.
  - Give counterpart briefing before going off shift.
- Environmental Support
  - Provide on-site assistance to the Operations Section Chief to minimize damage to land during oil spill containment and cleanup.
  - Develop suggested priorities for mitigation and preservation of key environmental areas and evaluate methods of cleanup and restoration for Operations Section Chief.
  - When land areas become oiled, conduct on-site surveys to determine the extent of damage to land and vegetation and feasibility of cleanup.

3.3.5 Planning Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	- Recommend environmental specialists who may provide the necessary expertise to conduct a physical and biological environmental monitoring program to assess the impact of the oil spill, including baseline, post-spill, and restored vegetation conditions. - Report to and receive briefing and special instruction from the Planning Section Chief. - Provide input in the development of the Incident Action Plan (IAP), and review the control objectives and alternative strategies. - Collect and verify environmental information within the incident area by reviewing pre-existing wildlife, environmental management plans and studies. - Determine environmental restrictions within the incident area and obtain necessary environmental permits. - Implement and monitor plans for disposal of recovered oil, oily and non-oily waste, and debris. Coordinate with the Operations Section Chief to assure that Hazardous Waste Emergency Response (HAZWOPER) trained teams are allocated for waste disposal work. - Participate as a member of a cleanup assessment team. - Provide liaison, when requested by the Alyeska Incident Commander, between the Alyeska Incident Management Team (IMT), government agencies, and environmental groups. This liaison is to be closely coordinated with the Government Liaison Coordinator and the Public Information Officer. - Maintain a "Unit Log" (Form ICS 214) throughout the response. - Turn all original documentation in to Documentation Unit Leader at end of each shift. - Give counterpart briefing before going off shift.		
Resource Unit Leader	Track current status of personnel, equipment, and supplies assigned to the oil spill response.	Assigned Field Personnel	• Learn to prepare T-Cards or computerized resource tracking system for all resources. • Prepare check-in procedures for tracking resources with security. • Establish liaison with Support Branch Director in Logistics.
	Functions During an Incident		
	• Report to and receive briefing and special instructions from Planning Section Chief. • Establish liaison with the Support Unit Leader in Logistics. • Set up and activate Resource Unit functions. • Establish check-in function at specified incident locations; coordinate with Security. • Using the "Initial Incident Briefing" package (Form ICS 201), prepare and maintain the Incident Command Post (ICP) display (Organization chart, resource allocation, and deployment sections of display). • Participate in Planning Section meetings as required by the Planning Section Chief. • Gather, post, and maintain incident resource status. • Gather, post and maintain resource status of transportation and support vehicles and personnel. • Coordinate with Security Officer, Operations Section Chief, and Logistics Section Chief. • Maintain a master list of all resources checked in at and assigned to the incident. • Prepare an "Incident Action Plan, Organizational Assignment List" (Form ICS 203) and "Organizational Chart" (Form ICS 207). • Develop and maintain the "Operational Planning Summary" (Form ICS 215) and display for Planning meetings. • Prepare appropriate parts of the "Incident Action Plan, Division/Group Assignment List" (Form ICS 204-1). • Provide resource summary information to the Situation Unit as requested. • Respond to request for status of resources and coordinate requests for obtaining additional resources. • Maintain a "Unit Log" (Form ICS 214) throughout the response.		

3.3.5 Planning Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Documentation Unit Leader	• Responsible for the complete documentation of the oil spill incident for future use. • Responsible for furnishing of information on activities taken in response to and as a consequence of oil spills. • Responsible to ensure that all documentation meets the requirements of *AMS-001, Documents Process*, and *AMS-016, Records Management Process*.	• Administrative Assistants • Assigned Personnel	Implement systems for collecting and storing oil spill information.
	Functions During an Incident		
	• Implement a system for maintaining a complete chronological record of activities related to the oil spill incident. • Assist all pipeline Incident Management Team (IMT) members in keeping a written historical record of their activities related to the oil spill incident. • Establish work area. • Establish and organize incident files in accordance with established procedures. • Establish duplication service and respond to requests. • Collect, retain, and file original copies of official forms and reports. • Provide duplicates of forms and reports to authorized requesters. • Prepare incident documentation for Planning Section Chief when requested. • Maintain, retain, and store incident files for after incident use, in accordance with established procedures. • Ensure that the Incident Action Plan is assembled, organized, and distributed in a timely fashion for each planning cycle. • Check on accuracy and completeness of records submitted for filing. Documentation submitted must be in ink (if handwritten) with no white out. Corrections must be lined through and initialed, if changed. • Prepare and route for approval all National Preparedness Response Exercise Program (NPREP) forms relating to oil spill incident/exercise credits. • Collect and provide for retention of video records or photographs of spill overflights or response operations. • Collect all records of permits obtained for specific operations that are subject to regulations, such as disposal of oil materials, utilization of government owned equipment, access to land, and utilization of chemical agents. • Maintain a "Unit Log" (Form ICS 214) throughout the response.		

3.3.5 Planning Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Technical Specialist	Responsible to the Operations Section Chief for technical service assistance as required by circumstances relating to any oil spill.	Engineering Specialist in the specific field required	
	Functions During an Incident		
	• Assist the Alyeska Incident Commander and the field on any question of piping and manifold detail and pipeline hydraulics. • Assist with the preparation of any required drain down or repair plans. • Furnish field technical assistance and personnel as required. • Work with Oil Movements on determining quantity of oil spilled. • Working with the Alyeska Incident Commander and appropriate pipeline personnel, coordinate requirements for Safety and Documentation. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Quality Assurance Specialist Duties	• Ensures that Incident Command System (ICS) actions are in compliance with Alyeska's Quality Program • Provides assistance to personnel preparing, revising and distributing documents such as manuals, procedures, and quality records to ensure that they meet appropriate Quality Program requirements • Reviews Management of Change (MOC) documentation for critical work activities on integrity level items. • Reports to the Planning Section Chief	Quality Generalist	• Obtain briefing from Planning Section Chief. • Establish a work area. • Maintain a "Unit Log" (Form ICS 214) as events occur. It is very important to maintain a comprehensive log. There may be litigation as a result of the Incident and you may find yourself constantly referencing back to the "Unit Log." • Assign and supervise other Quality Assurance individuals as needed. • Assist the Incident Commander and Planning Section Chief with any required delegation of Quality Program responsibilities. • Review MOC documentation. • Provide Quality Program input on procedure development, revision, and distribution. • Provide advice on Quality Records identification, control, and handling. • Maintain Quality Assurance Unit records. • Assure that Section Chiefs advise you of any changes or needs they may have. • Turn in all original documentation to the Documentation Unit Leader at the end of each shift. • Brief counterpart before going off shift.

3.3.5 Planning Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	Functions During an Incident		
	Meetings to Attend • Initial Incident Briefing • Planning Meeting	• Tactics Meeting • Incident Goals and Objectives	• Status Updates • Shift Briefing
Transition Liaison Duties	• Ensure an orderly transition from ICS mode to Project mode. • Identify scope, funding, and resource requirements. • Develop a transition timeline to provide adequate infrastructure for turnover to project status.	• Project Manager • Construction Supervisor • Project Engineer	• Obtain briefing from Planning Section Chief. • Identify specialized resources and permits. • Ensure long-term planning is established for the project duration. • Coordinate with the Logistics Section Chief, Operations Section Chief, and Resources Unit Leader for needed services and support. • Turn in all original documentation to the Documentation Unit Leader at the end of each shift. • Brief counterpart before going off shift.

3.3.6 Logistics Section

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Logistics Section Chief	Responsible to the Alyeska Incident Commander for providing operational personnel with the additional personnel, equipment, and supplies required to conduct containment and cleanup operations as requested by the Alyeska Incident Commander and to supplement logistic resources as needed.	• Assigned field personnel • Incident Management Team (IMT) Logistics Section Unit Leaders and staff	• Develop and plan source of supply of equipment and personnel to be available on emergency basis from outside contractors. • Develop a plan for moving equipment and supplies on an emergency basis to any specific location from other areas or outside sources. • Plan and expedite emergency contracts.

Functions During an Incident

- Obtain Incident Briefing from the Incident Commander.
- Implement Logistics Organization.
- Supervise Unit Leaders for dissemination of continual and accurate information.
- Obtain personnel and equipment requested by the Operations Section Chief or the Alyeska Incident Commander.
- Arrange for transportation of any additional personnel and equipment needed.
- Establish field camps or other lodging, and provide food for field personnel.
- Provide any additional supplies and equipment required.
- Provide additional third-party resources, as requested,
- Verify medical plans are being addressed.
- Provide food service, living quarters and office space as requested.
- Alert major service contractors of the oil spill emergency and activate them as necessary to support operational needs. Coordinate with Finance Section.
- Plan organization of the Logistics Section.
- Assign individuals as needed to fulfill tasks to be performed by the Logistics Section.
- Assign work locations and preliminary work tasks to section personnel.
- Assemble and brief Unit Leaders and Branch Directors.
- Participate in preparation of the Incident Action Plan (IAP).
- Identify service and support requirements for planned and expected operations.
- Provide input to and review communications, medical, and transportation plans.
- Coordinate and process requests for additional resources.
- Review the IAP and estimate section needs for the next operational period.
- Advise the members of the Incident Command Staff on the current service and support capabilities.
- Estimate future service and support requirements.
- Provide for general welfare and safety of Logistics Section personnel.
- Review and approve the "Operational Planning Summary" (Form ICS 215) as a commitment to provide resources by specific dates.
- Maintain a "Unit Log" (Form ICS 214) throughout the response.
- Turn all original documentation in to Documentation Unit Leader at end of each shift.
- Give counterpart briefing before going off shift.

3.3.6 Logistics Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Service Branch Director	• The Service Branch is composed of the Communications, Medical, Food/Facilities, and Personnel Units. • The Service Branch Director is responsible for management and coordination of all service requirements at the spill.	Incident Management Team (IMT) functions within Service Branch	Be familiar with existing contractors. Identify alternate/extra sources of supplies/ personnel.
	Functions During an Incident		
	• Obtain Incident Briefing from the Incident Commander. • Organize and prepare work assignments for Service Branch personnel. • Coordinate activities between units. • Maintain branch records. • Continually reevaluate level of service required to support operations. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Communications Unit Leader	• Responsible for radio and telephone communications systems adequate to meet the needs of the contingency operations. • Prepare plans for setting up and operating communications at the Incident Command Post (ICP).	Closest Supervisory Control and Data Acquisition (SCADA) Technician	• Provide for routine checkout and maintenance of the radio system in non-emergency periods. • Ensure that replacement batteries and recharging equipment for radios are located at each main use point. • Maintain a record of the distribution of radios and give the distribution list and call numbers to each Incident Command Post. • Periodically test and check emergency communication systems.
	Functions During an Incident		
	• Obtain Incident Briefing from the Logistics Section Chief. • Ensure that an adequate radio communication system exists between the field Incident Command Post and operating personnel including the following: - Alyeska Incident Commander - Operations Section Chief - Pipeline Controller - Logistics Section Chief - Safety Officer - Surveillance aircraft - Others, as necessary • Prepare and implement an "Incident Radio Communications Plan" (Form ICS 205). • Arrange for additional telephones, as necessary, at the ICP.		

3.3.6 Logistics Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Ensure that ICP Communications Center and Message Distribution Center are activated. • Provide for 24-hour manning of the headquarters radio. • Determine Communications Unit personnel needs. • Review prepared communications network. • Review the Incident Action Plan (IAP) for the current operational period. • Advise on communications capabilities/limitations during preparation of the IAP. • Activate telephone systems (assign extensions, request additional lines). • Verify that existing communications systems are functioning. • Establish a communication equipment accountability system. • Distribute personal portable radio equipment per the "Incident Radio Communications Plan." • Provide technical information as required on: - Adequacy of communications systems currently in operation. - Geographic limitation on communications systems. - Equipment capabilities. - Amount and types of equipment available and on order. - Anticipated problems in the use of communications equipment. • Provide on-site communications equipment troubleshooting, repair, and/or replacement. • Verify that equipment has been tested and repaired. • Supervise communications unit activities. • Maintain records on communications equipment as appropriate. • Recover equipment from relieved or released units. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Medical Unit Leader	Responsible for providing medical aid at the spill site(s) and support facilities.	• Station Guard Medic • Alyeska Corporate Medical Representative	• Identify medical resources throughout the state for possible contingency needs. • Establish contracts/agreements as necessary to support a full range of medical emergencies. • Verify that supplies are available. • Prepare procedures for a major medical emergency.
	Functions During an Incident		
	• Obtain briefing from Logistics Section Chief. • Participate in Logistics Section/Service Branch planning activities. • Determine level of emergency medical activities performed prior to activation of unit. • Activate Medical Unit • Prepare the "Medical Plan" (Form ICS 206). • Prepare medical reports. • Respond to requests for medical aid, transportation, and supplies. • Declare major medical emergency as appropriate. • Support the general well-being of personnel assigned to the incident.		

3.3.6 Logistics Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift. • Coordinate with Claims Unit Leader.		
Food/Facilities Unit Leader	• Responsible for providing food, potable water, and janitorial services to camps/ facilities that may be required to support oil spill activities. • Responsible for facilities such as the Incident Command Post, living quarters, and work areas for cooperating agencies who may locate their operations with the Incident Management Team (IMT).	Catering Manager	• Work with the catering contractor on contingency scenarios. • Prepare for potential camp and office facilities.
	Functions During an Incident		
	• Obtain briefing from Service Branch Director or Logistics Section Chief. • Determine type and number of facilities required. • Determine the method of feeding to best fit situation(s). • Determine location of work assignment and number of personnel assigned to base and remote work sites. • Arrange for transport of food/water when necessary. • Coordinate with other units to obtain necessary equipment and supplies. • Work with Safety Officer to ensure safety of all workers and support staff. • Ensure that the potable water supply is adequate. • Supervise the caterer in camp set-up and task performance. • Verify that the food service contractor provides incident personnel with well-balanced meals. • Verify that health/safety measures are in order for food handling and facility maintenance. • Maintain billeting/casual meal invoicing and documentation process. • Request activation of contracts to obtain necessary equipment and supplies to provide food catering service facilities. • Request personnel to operate facilities. • Activate incident facilities, which may include installation of sites for cleanup and rehabilitation of oiled wildlife. • Provide sleeping facilities near the Incident Command Post (ICP) and, if necessary, remote housing for personnel scheduled to remain at the incident location. • Provide facility maintenance services (e.g., sanitation, lighting, cleanup). • Demobilize the Incident Command Post and food services according to the Incident Demobilization Plan. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.6 Logistics Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Personnel Unit Leader	• Responsible for personnel procurement for the entire incident response. • Reports to the Logistics Chief.	Human Resources Generalists	• Ensures that contracts are in place to provide personnel when and if needed. • Gather and maintain Unit Leaders' estimates of personnel requirements.
	Functions During an Incident		
	• Obtain briefing from Service Branch Director or Logistics Section Chief. • Process personnel requests from all units. • Coordinate with Planning Section for required training. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Support Branch Director	• The Support Branch is composed of the Supply and Ground Transportation Units. • The Support Branch Director arranges for spill response support requirements to be met, including heavy equipment, materials, and warehousing coordination and transportation.	• P&CM • Transportation personnel	Develop and maintain contract lists for all necessary support activities.
	Functions During an Incident		
	• Receive briefing and determine initial support requirements. • Activate units as necessary and give work assignments. • Manage support activities at scene of incident. • Coordinate between Operations and Logistics Sections. Resolve conflicts and problems. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Supply Unit Leader	Provide equipment and materials for oil spill response as requested by the Operations Section Chief through the Planning Section Chief.	• Assigned field personnel • Materials Coordinator	Coordinate all ordering with the Planning Section Chief.
	Functions During an Incident		
	• Receive briefing from Support Branch Director or Logistics Section Chief. • Participate in Logistics Section/Support Branch planning activities. • Determine quantities of equipment and supplies remaining in inventory along the pipeline (containment boom, portable skimmers, and absorbents). • Provide construction and earth-moving equipment as required. • Determine which supply-related contracts have been activated, and the type and amount of supplies enroute.		

3.3.6 Logistics Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Research other oil spill response organizations and cooperatives to assess their response equipment and material status, locations, etc. • Order, receive, distribute, and store supplemental requests for supplies, personnel, and equipment to be used in direct support of the oil spill response or to replenish equipment/supplies used in the response. • Utilize designated warehousing facilities, and if necessary, coordinate with Finance Section to lease additional storage space and facilities. • Maintain positive control of supply and equipment ordering, distribution, and warehousing options. • Review the Incident Action Plan (IAP) for information on the extent of spill operation which will impact the supply unit. • Provide current status of all materials ordered, including estimated time of arrival (ETA). • Oversee suppliers to verify that requests for supplies and equipment are processed in an efficient manner. • Maintain an inventory of supplies and equipment, and ensure accountability of issued items. • Service reusable equipment and supplies (i.e., generators and boom). • Complete "Supply/Materials Request" (Form ICS 222). • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Ground Transportation Unit Leader	Responsible for providing transportation services in support of oil spill activities.	• Assigned field personnel • Transportation personnel	Maintain inventory of support and transport vehicles and equipment.
	Functions During an Incident		
	• Receive briefing from Support Branch Director or Logistics Section Chief. • Develop a traffic plan and implement after approval. • Arrange for fueling, maintenance, and repair of equipment. • Participate in Support Branch and Logistics Section planning activities. • Verify that maintenance contractors support out-of-service resources. • Notify Planning Section (Resource Unit) of all status changes on support and ground transportation vehicles. • Maintain inventory of watercraft support vessels, ground transportation vehicles, and heavy equipment. • Provide ground transportation of personnel and materials to incident. • Collect information on leased equipment. • Maintain transportation records. • Prepare "Support Vehicle Inventory" (Form ICS 218). • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.7 Finance Section

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Finance Section Chief	• Facilitate Authorizations for Expenditure (AFE) contracts and Blanket Purchase Orders (BPOs) for use by Alyeska responders during spill response. • Track emergency cost of operations.	Financial Analysts	
	Functions During an Incident		
	• Obtain incident briefing from the Incident Commander. • Track cost of emergency operations to date and projected cost of on-going operations for the Incident Commander. • Establish procedures with Finance Section Chief and Legal Officer for review of claims. • Assign individuals to positions in the Finance Section as needed. • Attend Planning meetings to gather information on the overall strategy to contain the oil spill. • Identify and order supply and support needs for Finance Section. • Develop an operating plan for the finance function on the oil spill response. • Prepare work objectives for subordinates, brief staff, make assignments, and evaluate performance. • Inform the Incident Commander and Incident Management Team (IMT) when section is fully operational. • Participate in preparation of Incident Action Plan (IAP). • Provide input in all planning sessions on finance matters. • Develop and administer a cash account. • Maintain daily contact with the offices of Alyeska's Corporate Financial Officer to coordinate financial activities. • Administer contracts and service agreements for necessary supplies, services, and consultants. • Provide accounting functions as directed, including auditing, billing, invoicing payments, and documenting labor, material, and services used during spill response operations. • Verify that obligation documents initiated during the spill response are properly prepared. • Monitor and record reimbursable expenditures. • Brief Contracting Party's Management Team (if applicable) on business management issues needing attention. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.7 Finance Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Claims Unit Leader	Responsible for receiving and forwarding claims for damage attributable to oil spill containment and cleanup operations.	Claims Adjuster	• Become thoroughly familiar with scope of oil spill plans and possible areas of liability. • Establish procedures to receive and forward claims for damage attributable to oil spill containment and cleanup operations.
	Functions During an Incident		
	• Obtain briefing from the Finance Section Chief. • Arrange for and supervise the services of damage surveyors and adjusters. • Establish contact with Safety Officer, Liaison Officer, and Legal Officer. • Obtain copy of the "Medical Plan" (Form ICS 206). • Coordinate with Medical Unit. • Ascertain the need for Compensation/Claims Specialists and order additional personnel if needed. • Verify that Compensation/Claims Specialists have adequate work space and supplies. • Brief Compensation/Claims Specialists on incident activities. • Coordinate with Contracts/Procurement Unit and Legal Officer on procedures for handling claims. • Periodically review logs and forms produced by Compensation/Claims Specialists to verify that: - Work is complete - Entries are accurate and timely - Work is in compliance with Alyeska requirements and policies • Keep Finance Section Chief briefed on Unit status and activity. • Maintain a current claims log and direct that forms be routed to the Alyeska Corporate Offices for post-incident processing control. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.3.7 Finance Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
Contracts/Procurement Unit Leader	Responsible for administering all financial matters pertaining to vendor contracts and service agreements. This unit is also responsible for equipment time records for rental equipment, such as boats and vehicles.	• Contract Administrators • Purchasing Specialists	• Obtain current listing of spill response vendor/service agreements. • Coordinate as necessary with Alyeska Corporate Headquarters when additional contracts need to be negotiated.

Functions During an Incident

- Obtain briefing from the Finance Section Chief.
- Coordinate with Claims Unit on procedures for handling claims.
- Activate existing contracts/agreements as needed.
- Establish and administer use of a cash account.
- Organize and direct time recording function
  - Rentals of aircraft, equipment, and transportation.
  - Rentals of boats
- Coordinate with Alyeska Corporate Headquarters to use existing Procurement/ Service Agreements and evaluate need for additional agreements.
  - Obtain listing of activated contracts/agreements.
  - Establish local procurement plan.
  - Determine if additional supplier/service agreements may be necessary based on spill size, complexity, and any special requirements.
- Develop an Incident Procurement Plan.
  - Ensure that plan meets response requirements.
  - Ensure that plan has complete listing of vendors/suppliers and phone numbers.
  - Assemble copies of activated contracts/agreements.
  - Provide completed plan to Supply Unit to implement.
- Check on equipment time recording for accuracy and completeness.
  - Coordinate with Transportation, Facilities, and Supply Units on their requirements for equipment rentals.
  - If necessary, assign time recorders to all units having responsibility for equipment.
- Verify completeness and accuracy of all equipment rental documents and inspection of equipment prior to signing rental documents.
- Interpret contracts/agreements and resolve claims and disputes within delegated authority.
- Maintain final incident receiving documents.
  - Obtain copies of all vendor invoices.
  - Verify that all equipment time records are complete.
- Verify all invoices.
  - Check completeness of all data entries.
  - Compare invoices against procurement documents.
  - Ensure that only authorized personnel initiated orders.
- Coordinate cost data in contracts with Time/Cost Unit Leader.
- Provide daily summary estimates of total expenditures for equipment and supplies purchased or rented for spill response efforts.
- Maintain a "Unit Log" (Form ICS 214) throughout the response.
- Complete final processing of billings and transmit documents to Alyeska Corporate Headquarters.

3.3.7 Finance Section (Continued)

Position	Primary Responsibilities	Operating Positions Assigned to This Oil Spill Function	Planning Functions
	• Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		
Time/Cost Unit Leader	• Recording personnel time • Collecting oil cost data • Performing cost effectiveness analysis • Providing cost estimates and cost saving recommendations for the response	Business Analyst	• Collect historical data from prior incidents. • Prepare in advance hourly rates of contractor.
	Functions During an Incident		
	• Obtain briefing from the Finance Section Chief. • Organize and establish Time/Cost Unit. • Determine requirements for time and cost recording function. • Establish procedures for recording time for personnel, subcontractor personnel, and consultants that are in accordance with time policies. • Establish commissary operations as required. • Maintain cost estimate forms. • Provide for records security. • Verify that all records are current or complete prior to demobilization or transfer of control to Contracting Party's Management Team (where applicable). • Collect and review time and cost reports from contractors and consultants on a scheduled basis. • Brief Finance Section Chief on current problems and recommendations and provide reports. • Ensure Section Chief advises of any changes or needs that may arise. • Maintain a "Unit Log" (Form ICS 214) throughout the response. • Turn all original documentation in to Documentation Unit Leader at end of each shift. • Give counterpart briefing before going off shift.		

3.4 REALISTIC MAXIMUM RESPONSE OPERATING LIMITATIONS [18 AAC 75.425(e)(3)(D)]

3.4.1 Climate Matrixes

To illustrate the basic impacts of environmental conditions on response components, Alyeska has utilized a climate matrix that identifies workable ranges for effective response.

The matrix is organized into four parts to more clearly represent the pipeline corridor, which spans 800 miles with four climatic zones.

1. Arctic
2. Continental
3. Transitional
4. Maritime

Each matrix follows the discussion of the zone and is labeled with the general milepost boundaries of these zones. The matrix presents general indications of the effect of a single factor in a single zone on a specific component of the response. A two-dimensional matrix cannot quantify or illustrate the impact of multiple variables and the interrelationship of such factors acting in concert. The narrative discussion and the matrixes are incorporated into Volume 1, Section 3.4.2, “Operating Limitations.”

3.4.2 Operating Limitations

Alyeska’s response objectives include personnel safety, resource deployment, and operational strategies for the best possible outcome within the given environmental conditions. Strategies are designed to control and contain a potential oil spill and to use a variety of tactics with dams, berms, booming, and sorbents.

Ideal response conditions include:

- Calm winds
- Unlimited visibility
- No precipitation
- Warm temperatures
- Minimal tides
- Slow moving streams or rivers
- No ice or debris
- Sufficient daylight
- No other environmental conditions that would impact safety or response equipment

However, actual response effectiveness may be influenced by less than the ideal conditions mentioned above, or unforeseen circumstances, such as equipment malfunction, human injury, or casualty. Road

closures due to washouts, floods, snow, etc., may impact oil spill response activity and transportation along the state highway system.

The effect environmental conditions have on the efficiency and safety of response personnel will be similar no matter which response strategy is implemented. It is unlikely that response personnel can safely be dispatched when:

- Winds exceed 40 to 50 knots
- Ambient temperatures remain below -40°F
- Other factors such as visibility and precipitation, combined with marginal winds and temperatures, create unsafe conditions

Such conditions not only affect, but also could damage, response equipment during deployment and would render repairs difficult. The effect of each of these factors is cumulative.

Environmental Factors that Affect Response and Prevention Activities

Environmental variables can only be described in general terms relative to when and how they may impact an operation. The efficiency of a response cannot be described in terms of the impact of a single environmental condition. Finitely pinpointed or binomially described (yes or no), cut-off points, which specify the efficiency of a response, are not realistic. Therefore, any expression of how the frequency and duration of an environmental variable could limit a response must be presented in two parts:

1. Extreme “upper-limit” where a response would be either impossible or futile

2. “Lower-limit” where a response would be possible but the efficiency of the response is likely to be affected (depending on the overall environmental conditions)

As a result, a plan cannot describe a “cut-off-point” that either makes the response possible or not possible (i.e., that response is possible at 29 knots, marginal at 30 knots and not possible at 31 knots). In addition, environmental variables may be extremely favorable for a response while other unforeseen factors render the response ineffective. Conversely, some environmental conditions may fall outside the “predicted” ranges for a response, while other circumstances mitigate to allow at least a partially effective response. Some response methods could be employed by the responders under most environmental conditions.

There will always be an inherent risk in moving oil even though that risk has been reduced by prevention measures described in this plan. At any time during transit of oil or after an Incident, the environmental factors, singularly or in combination, could hinder a response. It is not possible to capture and quantify risks not present at the precise moment of a spill.

Weather, climatology, and environmental factors are discussed throughout this plan and include the following statement: “Circumstances such as weather or breakup of ice on a large river, could create situations in which containment activity would be futile. When this occurs, Alyeska management, in consultation with the state and federal supervisory authorities, will determine if it is prudent to refrain from attempting to contain discharged oil. In all cases, the risk to human beings, wildlife, and the environment

will be considered in determining the course of spill response actions." Risks to humans, wildlife, and the environment are considered in that order.

Any meteorological or climatological analysis should be based on current histories and recorded climatic conditions. The following discussions of Realistic Maximum Operating Limitations (RMOL) represents a best estimate of actual conditions at any given time. RMOL frequency and duration estimates are provided in increments of 5% and represent an estimated maximum or general approximation.

The pipeline corridor is divided into four climatological zones. Each climatic zone is discussed below, and in Table 3-4, with reference to the potential operating limitations factors.

(b) (7)(F), (b) (3)

[redacted]

3.4.2.1 Arctic Climatic Zone Table 3-4

Winds

Strong winter winds are common and would normally be expected to affect response activities. Strong winds may make aircraft and boat conditions unsafe or reduce the operational efficiency of personnel and equipment to respond. Estimated impact is less than 5% per annum.

Winds can cause white-out or drifting conditions within the zone from (b) (7)(F), (b) and the immediate Atigun Pass area. Although they could occur at any time from mid-September until mid-May, these conditions are estimated to affect response actions less than 10% of any given year. During this same time period, cold temperatures could slow the movement and spread of spilled oil.

As a single variable, wind is not a limiting factor. But in conjunction with other variables, for example, precipitation or temperature, it may preclude a response. Wind with blowing snow (reduced visibility) or wind with cold temperatures (personnel at risk for developing hypothermia) are examples of the impact of multiple variables.

Precipitation

Precipitation is extremely light and often less than 7 inches per year. There are occasional rain and thunderstorms in the region in mid-summer. Areas closer to mountainous terrain can expect periods of heavy run-off or flash water/slush floods during late spring and early summer. In Atigun Pass, avalanches occur periodically from late October until late May. Precipitation alone should not be a major factor influencing response efforts. Estimated impact is less than 1% per annum.

Temperature

Temperature variations are moderate. The mean annual temperature varies from 10ºF to 20ºF. The range of temperatures can vary from highs in the 80ºF range to lows in the -60ºF range. Alyeska's *SA-38,*

Corporate Safety Manual, provides information on arctic clothing and travel restrictions. Generally, temperatures of -40ºF or colder are very dangerous to exposed skin and could impede response actions. Temperatures will affect oil characteristics and increase viscosity. In some ways, they could improve containment and recovery efforts. Generally, temperatures could impact response efforts by less than 15% per annum.

Visibility

Within this zone, visibility will be affected by reduced daylight, blowing, drifting snow, misting, ice fog, and occasionally dust in river floodplains. Low ceiling periods due to cloud and fog conditions can diminish visibility and prevent aircraft landings at airstrips. Except for the influence of daylight and potential for delay in response time, fog and clouds should not impact or reduce ground efforts at the site. Visibility impacts on ground efforts are estimated at less than 5%. Visibility impacts on aircraft support are estimated at approximately 20% per annum.

Tidal Effects

In the Arctic Zone some tidal effects will be noticed in the mouth of the Sagavanirktok River as it is influenced by the Beaufort Sea. Arctic water levels are affected by marine influences in the summer, but not to any great extent in the winter.

Ice and Debris Effects

Volume 3 details the effects of ice on the numerous rivers and drainages found in the Arctic Zone.

In general, ice is very thick from late October until mid-May. During breakup, water flow starts as over-ice flow; ice dams and troughs could be used to assist containment until breakup and free-flowing rivers occur. The bulk of any debris in the Arctic rivers would be found in the form of sediments.

Freezeup normally occurs in the Arctic Zone from September to November depending on water volume and velocities. Ice or debris would be a factor in diminishing the effectiveness of response efforts. Personnel safety considerations should be evaluated prior to commencing on water containment, recovery, and cleanup actions, particularly when the response occurs during the breakup and freeze up periods.

Daylight Hours

Lack of daylight in portions of the Arctic Zone will be a contributing factor to a slower and more cautious approach to the response effort from late mid-October until late February. Conversely, responders can anticipate almost continuous daylight from late April until late August when rivers and streams are open and flowing.

Other

River velocities vary considerably with the seasons. During the winter months (typically from late October until May) the rivers have very little, if any, surface flow. Subsurface flows have been known to remain flowing within the gravel river beds even during late winter. Spring usually begins as surface flow over ice until ice formations have thawed and flow velocities can be high. During the summer and fall months, high

velocity flows are usually intermittent, with an occasional heavy run-off in the mountain areas caused by regional storms. Velocities will vary from 0 to 10 feet per second or greater. River velocities would be a significant limiting factor approximately 10% or less per annum.

Aufeis conditions can exist throughout the area during the late fall to early spring months. Aufeis conditions are prevalent in the Sagavanirktok and Atigun rivers as well as all the various streams in the Arctic region. Aufeis can be used to assist in oil containment and recovery since access may or may not be impeded.

Permafrost must be considered when gaining access to a discharge and cleanup site within the entire Arctic Zone. There is a chance that thermal erosion can occur at any time during discharge, containment, recovery, and cleanup periods. Permafrost can be a containment asset as it prevents downward migration of spilled oil.

3.4.2.2 Continental Climatic Zone Table 3-4

Wind

Very strong winds could be expected for brief periods in mountainous areas. Wind should not affect ground response efforts but it may marginally impact aircraft and watercraft support capabilities. Estimated impact is less than 5% per annum.

Wind can reduce visibility and cause white-out conditions within the zone, primarily from PS05/Prospect Response Base to PS06/Yukon Response Base, from (b) (7)(F), (b) (3) the open terrain area from Bonanza Creek through the Fort Hamlin Hills to the Yukon River. These conditions restrict logistical support efforts along the Dalton Highway, and are most prevalent from mid-October until April of any given year. The white-out conditions are estimated to affect response actions 10% or less per year.

Precipitation

Precipitation varies from 10 to 14 inches per year. It will be in the form of snow from late fall until late spring. There are occasional rain and thunderstorms mid-summer. Precipitation alone should not impact response efforts, however, when one or two other environmental factors are added to the scenario (like wind and/or low temperatures), response activities would be impacted by less than 1% per annum.

Temperature

Temperatures in the Continental Zone have significant diurnal and annual variations. Fairbanks, for example, has recorded a maximum of 95ºF and a minimum of -62ºF. Mean annual temperatures vary from 15°F to 25°F. Alyeska's *SA-38, Corporate Safety Manual*, provides information on arctic clothing and travel restrictions. Generally, temperatures of -40ºF or colder are very dangerous to exposed skin and could impede response actions. Temperatures will also vary a great deal during any given day depending on cloud cover and wind conditions.

Cold temperatures will affect oil characteristics, increases viscosity, and in some ways can improve containment and recovery efforts. Generally, temperature alone would impact response efforts less than 15% per annum. This does not mean that no response effort will occur, but acknowledges the efficiency of the effort would be reduced.

Visibility

Within this zone, visibility will be affected by available daylight hours, blowing or drifting snow, and wildfires. There are periods when low ceilings may occur due to low clouds, fog or misting/icing conditions which would diminish visibility and impact support aircraft. Besides hours of available daylight impacts, the physical impacts of fog and clouds should not significantly reduce manual labor or ground efforts at the site, though time to respond could be lengthened. Thus, visibility impacts to ground efforts is estimated to be less than 5% or less per year, but impacts to aircraft support is estimated to be 15% per annum.

Tidal Effects

There are no tidal effects within this zone.

Ice and Debris Effects

Volume 3 covers in greater detail the effects of ice on the numerous rivers and drainages found in the Continental Zone. In general, from November until April of any given year, ice is thick enough to hinder oil from entering water beneath the ice. Winter cleanup methods can use ice conditions to an advantage. During breakup, water flow normally starts as over-ice flow. Ice dams and troughs can be utilized to contain oil until formal breakup and free-flowing river conditions occur. The bulk of any debris in the Continental Zone rivers and streams would be sticks, uprooted trees, and sediments.

There may be periods when individual rivers and streams have uprooted trees and sticks in the flow. Larger streams and rivers will have log jams which could trap spilled oil making total recovery operations difficult. This variable is so dependent on the actual condition of the waterway during any given year that to assign a percentage of impact per annum would not be practical.

Freezeup in rivers and streams will diminish until total river or stream ice cover has occurred, unless the river and stream characteristics are of the type having subsurface flow throughout the winter season. Some streams and low flow glacial source rivers freeze to the bottom. Normally, freezeup occurs from October until December, depending on water volume and velocities. Ice or debris may be a factor in diminishing response efforts during the transitional spring and fall periods and may make effective containment and responder safety a more important factor to consider.

Daylight Hours

Diminished daylight in portions of the Continental Zone is a factor contributing to a slower and more cautious response approach from November until February. Conversely, portions of the zone receive almost continuous daylight from May until August.

Other

River velocities vary considerably depending on the waterway under consideration. Volume 3 discusses individual water bodies in greater detail. Velocities vary considerably with the time of year, the seasons, and precipitation amounts throughout the zone. During winter months (typically from November until April), rivers and streams have very little if any surface flow. Subsurface flow has been known to continue within the gravel river beds even during the winter. The spring flow usually begins as surface over-ice flow

until ice formations have been cut or thawed. In spring, flow volume and velocity are expected to be high. During the summer and fall months, flow volume usually varies with an occasional heavy runoff from isolated storms in mountain areas. Velocity will vary from 0 to 10 feet per second or greater for any given river or stream and any given time of the year. Response efficiencies and methods may be affected by changes in river velocity and flow volume.

Aufeis conditions exist throughout the Continental Zone's waterways during the winter to early spring months. This phenomenon may hinder or assist discharge containment, and recovery efforts since access may or may not be impeded. Aufeis may also occur in drainages along state highways and hinder transportation activities for brief periods of time. The impact of aufeis on response actions is less than a matter of hours during this time of year.

Permafrost must be considered when gaining access to cleanup sites within the entire Continental Zone. Thermal erosion can occur at any time during a discharge, containment, recovery, and final cleanup period. This geological condition should not impact response actions but may affect efficiencies and the methods used to perform containment and recovery actions in order to protect permafrost areas from long term damage.

3.4.2.3 Transitional Climatic Zone Table 3-4

Wind

Very strong wind can be expected with durations from hours to days in mountainous areas. Unless the wind accompanies other environmental and climatic conditions, such as precipitation or extreme temperatures, it should not have a significant effect on ground response actions. It may impact aircraft and watercraft support capabilities depending on the force of the wind. Expected impacts due to wind are estimated at less than 10% per annum.

Wind can contribute to white-out conditions or reduced visibility anywhere within the Transitional Zone. However, the areas from approximately (b) (7)(F), (b) (3) .

These conditions are more prevalent from November until April of any given year. Because wind can exacerbate conditions and contribute to road closures due to drifting snow or avalanches, it is estimated that wind impacts a response by 5% per annum. During the colder months of the year temperatures will be a factor which could assist recovery operations, since viscosity of the oil would increase.

Precipitation

Precipitation averages 15 to 40 inches per year. Within the zone, there is a difference between the northern limit of the zone, which has low humidity and lesser amounts of precipitation (it borders the Continental Zone), and the southern limit, which has a greater level of humidity on the average (it borders the Maritime Zone). Precipitation will be in the form of snow during mid-fall until late spring. Occasional rain and thunderstorms occur in the zone during the summer. The southern portion of this zone may experience some rain activity even during the winter, depending on the intensity of Gulf of Alaska storms which may migrate inland.

Precipitation by itself should not impact response efforts. However, response activities may be impacted when other variables are added to any given scenario. The estimated amount of precipitation impact on response operations in the Transitional Zone ranges from a high of 15% in the south to less than 5% in the north per annum.

Temperature

The Transitional Zone has more pronounced temperature variations in any given day of the year than any other zone along the pipeline corridor. Temperatures within this zone have characteristics of both adjacent zones. Extreme temperature variations can occur on the northern border adjacent to the Continental Zone, with moderating influences by the Maritime Zone on the southern end.

Alyeska's *SA-38, Corporate Safety Manual*, provides information on personal protection for arctic conditions and travel restrictions. Generally, temperatures of -40ºF or colder are considered dangerous to exposed skin, and could impede response actions. Temperatures also vary considerably during any given day depending on cloud cover and wind conditions. Cold temperatures affect oil characteristics and increase viscosity and in some ways improve containment and recovery efforts. Estimates of temperature impact on any response activity within this zone will vary across the limits of the zone, but may affect the activity 10% or less per annum. It is important to note that response activities would never be at zero level because planning, mobilization, and logistics efforts can go forward regardless of temperature effects.

Visibility

Visibility will be affected by loss of daylight due to seasonal changes, blowing or drifting snow, smoke from wildfires, and suspended dust particles along river flood plains. Periods of low ceilings, fog or misting/icing conditions will also diminish visibility and impact aircraft support. Watercraft will lose efficiencies during these same periods, but response actions generally could continue. Ground response efforts should not be impacted by a diminished level of visibility. However, impacts related to response time and efficiencies should be expected. Reduced visibility impacts to air support could be as high as 10% during any given year.

Tidal Effects

Tidal effects do not impose any impacts to response actions within this zone.

Ice and Debris Effects

Volume 3 details the effects of ice on the numerous rivers and drainages found in the Transitional Zone. In general, ice will be encountered from late October until May at any given location. During breakup, the water flow will normally cut surface ice and form a channel until sufficient warming has occurred to melt the ice cover. In winter and spring, the ice cover may be used to contain and assist with recovery efforts.

The bulk of any debris found in Transitional Zone waterways is in the form of uprooted trees, sticks, and sediments, especially during spring breakup. Most water courses may have log jams which could entrap oil and hinder recovery operations. This variable is so dependent on the actual condition of the water course at the moment of response, the assignment of a percentage of impact per annum would not be practical.

Freezeup normally occurs from October through December depending on water volume and velocities. During winter conditions ice or debris should not be a factor in diminishing response efforts, but seasonal transition periods may make containment, recovery efficiency personnel safety a more important factor to consider.

Daylight Hours

Diminished daylight may contribute to a slower and more cautious approach to any response effort from November until late January. Portions of the Transitional Zone receive nine hours or less of daylight during this period. However, the lack of daylight alone should not be a limiting factor in response actions. Artificial lighting may be necessary to supplement containment, recovery, and cleanup activities.

Other

River velocities and flow rates - These conditions vary considerably among the rivers and streams within the zone. Volume 3 discusses these drainages in detail. Seasonal and precipitation velocities vary significantly throughout the zone. Subsurface flows have been known to continue beneath river ice and gravel beds, even during the winter and early spring months. During the spring runoff period, velocities and flow rates should be high. This may impact response efficiencies. During the summer and fall months, flow is usually more constant but may increase at any time due to rainfall in the mountainous areas.

Aufeis - Aufeis can exist throughout the Transitional Zone and is normally apparent from late fall until spring. This phenomenon may hinder or assist response activities since access into a site may or may not be impeded. Aufeis can also be expected in drainages along the state maintained Richardson Highway and at times may hinder logistical activities for brief periods of time. Impacts to response actions can be expected in less than a matter of hours for any affected location in any year.

Permafrost - Permafrost varies from isolated masses of ice with area of discontinuous permafrost to areas of no permafrost in the Alaska Range and Chugach Mountains. This natural condition will be a consideration for gaining access to discharge and clean-up sites. There is a chance that thermal erosion can occur at any time in permafrost areas. Normally this geological condition should not impact response actions. However, it may affect efficiencies and the selection of containment and recovery actions in order to protect permafrost areas from long term damage.

Avalanches - Certain areas within the Transitional Zone are susceptible to road and work pad closures due to potential avalanche hazards. Such areas are found in the Trims Creek to Phelan Creek area south o(b) (7)(F), (b) (3), throughout the Tiekel and Tsina River areas. Road closures are not uncommon and can last for several hours. Because avalanche dangers exist along the pipeline right-of-way in these same general areas, avalanche conditions need to be surveyed prior to committing personnel into a potentially dangerous situation. This condition is site-selective and it is expected that any impact to restrict response activity would be less than 5% per annum. The activity itself will take longer in heavy snow areas and labor efficiencies will decrease.

3.4.2.4 Maritime Climatic Zone Table 3-4

Wind

Periods of very strong wind can be expected in this zone year-round. Normally, there will not be a major impact to ground response but logistical air and watercraft support could be hampered. Unless the wind accompanies other environmental and climatic conditions, such as precipitation and cold temperatures, strong winds should not have a great effect on response to commence containment and recovery actions. Impacts due to wind can be expected at less than 5% per annum.

Wind can contribute to white-out or reduced visibility anywhere within the zone, but is more likely to affect traveling the Thompson(b) (7)(F), (b) (3) and support equipment performance along the Lowe River floodplain from(b) (7)(F), (b) (3) Terminal at the Port of Valdez. Strong winds in this zone could exacerbate conditions and contribute to road closures, due to drifting snow and avalanches Spill response efficiencies are expected to be impacted by as much as 10% per annum. Windy conditions during colder months may become a safety factor and restrict response efforts or reduce efficiencies.

Precipitation

Precipitation levels within this zone are the highest of any of the climatic zones along the pipeline. Average annual amounts are often greater than 60 inches per year. Snowfall is usually very heavy, averaging 200 to 800 inches per year. In addition, humidity levels are normally high. Precipitation by itself would normally not impact any response function. If taking quantities into account, the situation would need to be evaluated constantly during the event so as to not place response personnel into a life-threatening risk situation.

Precipitation will normally be in the form of snow from October until April. Rain can occur at any time, including the middle of winter. Storms originating in the Gulf of Alaska will also affect the amount of precipitation received. Response impacts due to precipitation are estimated at 20% per annum. Refer to *CP-35-2, Valdez Marine Terminal Oil Spill Prevention and Contingency Plan*.

Temperature

Temperatures within the Maritime Zone are considered moderate compared to the other zones. Temperature variations throughout the year are the smallest of all four climatic zones. The mean average temperature within this zone is 35ºF. Temperature should not affect response activities unless other adverse climatic characteristics are involved.

Alyeska's *SA-38, Corporate Safety Manual*, provides additional information on personal protection and travel restriction. Generally, temperatures of -40ºF or colder are considered dangerous to exposed skin, and at these levels, could impede response actions. Cold temperatures also affect oil characteristics and increase viscosity and can improve containment and recovery efforts. The Maritime Zone occasionally experiences temperatures which increase the risk of hypothermia.

Visibility

At Valdez, visibility is poorest in winter. Low clouds, snow or fog are the major causes of restricted visibility at this time of year. Visibility less than or equal to one mile occurs 3.7% of the time at the Valdez

airport. Visibility greater than five miles occurs 85% of the time. Visibility at the Terminal is slightly poorer than at the airport.

Reduced visibility can make aerial surveillance of a slick less effective or impossible. Other operations may become more difficult during periods of reduced visibility.

Tidal Effects

The tide at Port Valdez has a diurnal range of 12.0 feet and a mean range of 9.7 feet, oscillating with a mixed mode of both diurnal and semi-diurnal periodic activities. Specific tidal data for Port Valdez are available in standard tide tables published annually by the Department of Commerce, and the National Oceanic and Atmospheric Administration, National Ocean Service.

The tidal range, and storm activities in particular, can affect oil distribution and oil spill response operations. Oil can be grounded at the uppermost limit of the tide and grounded oil can be introduced to nearshore waters by tidal action. Light to moderate accumulation of grounded oil can appear as discontinuous or continuous patches and streaks along the tide line. Large quantities of oil can completely cover the shoreline to a thickness of several inches. Oil booms and their attendant anchors may be displaced and have to be repositioned due to tidal effects. Boats and equipment that are not properly anchored or secured onshore can break free by tidal changes or storm surges.

Ice and Debris Effects

Volume 3 details the effects of ice on the numerous drainages found within the Maritime Zone. In general, ice would normally be encountered from November until April of any given year. During breakup, the water flow will normally cut a surface channel in the ice cover and thereafter diminish the cover until the waterway is free of ice. There may be a portion of time during breakup when large chunks of river ice have the potential to harm personnel and impede response activities.

The bulk of any debris found within these waterways is sediments which occur year-round, but chiefly during the spring breakup. Timber mixed with flow and along channel edges and high channel areas can restrict response activities throughout the year and at individual drainages. Deadfall may be found in some drainages year-round. This variable is so dependent on actual conditions at the moment of response that to assign a percentage of impact per year is impractical.

Daylight Hours

Number of daylight hours should not be a major impact to ground response activities. Reductions in efficiencies can be expected, however, and artificial lighting may be required to supplement the lack of light at specific sites. Aircraft support may be impacted due to a reduction of visibility, but methods and procedures are available to mitigate this factor. *CP-35-2, Valdez Marine Terminal Oil Spill Prevention and Contingency Plan,* lists the average time of sunrise and sunset for Valdez, Alaska (61ºN Latitude). From May through July, there are over 18 hours of daylight. In December, daylight is reduced to approximately 5 hours.

Other

River velocities and flow rates - Velocities and flow rates vary considerably among the rivers and streams within the zone. Volume 3 discusses these drainages in detail. Precipitation within the zone and in neighboring mountain areas will affect the volume of flow in a river at any given time. High volumes and velocities can be expected during spring runoff periods. During the late fall and early winter, volumes and velocities diminish.

Aufeis - This condition should not be a major impact to response functions and techniques. It is covered in detail in Volume 3. Aufeis can be expected to occur in drainages along the State maintained Richardson Highway, which at times may hinder logistical support efforts for brief periods of time.

Permafrost - This zone is generally free of permafrost. However there may be areas where isolated areas could be encountered, and care should be taken not to induce thermal erosion during response efforts.

Avalanches - There are areas within the Maritime Zone which are subject to heavy snow conditions, high wind, and changing temperatures. These conditions enhance the possibility of an avalanche occurring. These potentially unsafe conditions will be found along the work pad and right-of-way of the pipeline and along the public road from (b) (7)(F), (b) (3) [redacted]. This area may experience a localized sloughing of snow loads on slopes which may be a safety problem, and would have to be addressed prior to committing response personnel into a potentially dangerous situation. Again, this condition is site-selective and impacts from avalanches would affect response activity by less than 10% per annum. Response activity would be less efficient in heavy snow areas and logistical support function efficiency would be reduced.

TABLE 3-4 CLIMATE MATRIX

Item Deployment	Weather Wind – W Precipitation – P Temperature – T Visibility - V	Tides/Currents River Velocities	Ice and Debris Breakup Freezeups	Daylight	Other Conditions Aufeis Permafrost Avalanche Drifting Snow	Remarks	Conditions that Could Preclude a Response
(b) (7)(F), (b) (3)		**ARCTIC CLIMATE ZONE**					
Personnel	W –WC P – NA T -≤-35°F V - Fog, mist, white out	High river velocities will impact response time and increase safety requirements	Requires increased safety measures and will impact response time	Response time impeded from November to February. Twenty-four hours available from May until August.	Aufeis presents special safety factors. Avalanche danger in Atigun Pass area	Road conditions SA-38, Section 5	Temperatures lower than -40°F wind with chill factors
Vehicles and Equipment	W - Blowing snow P – NA T -≤-35°F V - Fog, white out	NA	NA	NA	Aufeis safety factors. Permafrost, environmental factors will restrict response and recovery access.	Road conditions *SA-38*, Section 5	Road conditions if road is closed due to blowing snow, temperatures < -60o F. White-out conditions
Vac Trucks	W - Blowing snow, WC P – NA T -≤-35°F and O&M V - Fog, white out	NA	Ice and debris will cut efficiency.	NA	Aufeis. Safety factors. Permafrost conditions will restrict access.	NA	Freezing conditions
Aircraft Support	W - Limits @ > 40 knots P – NA T -≤-40°F and O&M V - 1 mile or 300' C	NA	NA	Lack of daylight may require additional safety measures.	NA	NA	low visibility <-40°F, high winds
Boats	W - O&M P – NA T -≤-35°F V - Fog impacts	Non-freezing conditions limited by motor output. Velocity impacts. Wave action impacts. O&M manuals	Breakup or freezeup ice conditions may preclude utilization.	NA	NA	Road conditions *SA-38*, Section 5	River currents, wave action, ice, debris, and low water levels
Boom	W - Impacts from 10% P – NA T - Sub-zero temperatures V - NA	Effective at currents <2 knots or 3.5 fps. Limited use in 5 knot current using specific techniques	Limited usefulness during breakup and freezeup	NA	NA	Road conditions *SA-38*, Section 5	Ice, debris, current, frozen conditions
Skimmer	W – Effected P – NA T - Sub-freeze and O&M V - NA	NA	Efficiency reduced	NA	NA	Road conditions *SA-38*, Section 5	NA

TABLE 3-4 (CONTINUED) CLIMATE MATRIX

Item Deployment	Weather Wind – W Precipitation – P Temperature – T Visibility - V	Tides/Currents River Velocities	Ice and Debris Breakup Freezeups	Daylight	Other Conditions Aufeis Permafrost Avalanche Drifting Snow	Remarks	Conditions that Could Preclude a Response
Pumps	W –NA P – NA T - Sub-freeze and O&M V - NA	NA	Increased labor will be required to maintain operating efficiency.	NA	NA	NA	NA
(b) (7)(F), (b) (3)	**CONTINENTAL CLIMATE ZONE**						
Personnel	W –WC P – NA T -≤-35°F V - Fog, white-out	High river velocities will impact response time and increase safety requirements.	Requires increased safety measures and will impact response time.	Response efficiency impeded from November to February. Twenty-two hours available from May until August.	Aufeis presents special safety factors. Avalanche danger in mountain pass area.	Road conditions *SA-38*, Section 5	Temperatures lower than -40°F. Wind chill factors
Vehicles and Equipment	W -Blowing snow P – NA T -≤-35°F V - Fog, white-out	NA	NA	NA	Aufeis safety factors. Permafrost, environmental factors will restrict response and recovery access.	Road conditions *SA-38*, Section 5	Road conditions, if road is closed due to blowing snow, temperatures <-60°F. Wind chill factors
Vac Trucks	W -Blowing snow, WC P – NA T -≤-35°F and O&M V - Fog, white-out	NA	Ice and debris will cut efficiency.	NA	Safety factors. Permafrost conditions will restrict access to certain sites.	NA	Freezing conditions
Aircraft Support	W - Limits @ >40 knots P - Aviation Manual T -≤-40°F V -1 mile or 300' C	NA	NA	Lack of daylight may require additional safety measures.	NA	NA	Visibility below minimums.
Boats	W - O&M P – NA T -≤-35°F V - Fog impacts	Non-freezing conditions limited by motor output. Velocity impacts. Wave action impacts. O&M	Breakup or freezeup ice condition may preclude utilization	NA	Safety factors	Road conditions SA-38, Section 5	River currents and high wave action.
Boom	W - Effects from10% P – NA T -Sub-zero temperatures V - NA	Effective at currents <2 knots or 3.5 fps. Limited use in 5 -7 knot current using specific techniques.	Not efficient/effective during breakup and freezeup	NA	NA	Road conditions SA-38, Section 5	Ice, debris, current, frozen conditions

TABLE 3-4 (CONTINUED) CLIMATE MATRIX

Item Deployment	Weather Wind – W Precipitation – P Temperature – T Visibility - V	Tides/Currents River Velocities	Ice and Debris Breakup Freezeups	Daylight	Other Conditions Aufeis Permafrost Avalanche Drifting Snow	Remarks	Conditions that Could Preclude a Response
Skimmer	W- Affected by waves P – NA T -Sub-freeze and O&M V -NA	NA	Efficiency reduced	NA	Maintenance factor	Road conditions SA-38, Section 5	NA
Pumps	W – NA P – NA T - Sub-freeze and O&M V- NA	NA	Increased labor will be required to maintain.	NA	NA	NA	Oil too viscous to pump due to low temperatures.
(b) (7)(F), (b) (3)	**TRANSITIONAL CLIMATE ZONE**						
Personnel	W –WC P – NA T -≤-35°F V - Fog, mist, white out	High river velocities will impact response efficiency and increase safety requirements	Requires increased safety measures and will impact response efficiency.	Response efficiency impacted from November to February.	Aufeis and avalanche danger requires special safety arrangements.	Road conditionsSA-38, Section 5	Any combination of factors which threatens life safety.
Vehicles and Equipment	W - Blowing snow P – NA T -≤-35°F V - Fog, white out	NA	NA	NA	Aufeis. Safety factors.	Road conditionsSA-38, Section 5	Breakup or icing conditions
Vac Trucks	W - Blowing snow, WC P – NA T -≤-35°F V - Fog, white out	NA	Ice and debris will cut efficiency.	NA	Aufeis. Safety factors.	NA	Freezing conditions
Aircraft Support	W - Limits @ > 40 knots P – NA T -≤-40°F and O&M V - 1 mile or 300' C	NA	NA	Lack of daylight may require additional safety measures	NA	NA	Ice fog
Boats	W - O&M P – NA T -≤-35°F V - Fog impacts	Non-freezing conditions limited by motor output. Velocity impacts. Wave action impacts. O&M manuals	Breakup or freezeup ice condition may preclude utilization.	NA	Safety factors	NA	River currents and high wave action.

TABLE 3-4 (CONTINUED) CLIMATE MATRIX

Item Deployment	Weather Wind – W Precipitation – P Temperature – T Visibility - V	Tides/Currents River Velocities	Ice and Debris Breakup Freezeups	Daylight	Other Conditions Aufeis Permafrost Avalanche Drifting Snow	Remarks	Conditions that Could Preclude a Response
Boom	W - Impacts from 10% P – NA T - Sub-zero temperatures V - NA	Effective at currents<2 knots or 3.5 fps or up to 5 - 7 knot current using special techniques	Not advisable during breakup and freezeup.	NA	NA	NA	Ice, debris, current, frozen conditions
Skimmer	W – Effected P – NA T - Sub-freeze and O&M V - NA	NA	Efficiency reduced	NA	Maintenance factor	NA	NA
Pumps	W –NA P – NA T - Sub-freeze and O&M V - NA	NA	Labor required to maintain	NA	Maintenance factor	Road conditions *SA-38*, Section 5	NA
Others	NA	No tidal influence within this zone. Seasonal conditions may change velocities and flows dramatically.	Expect heavy siltation during summer months on some waterways within this zone.	NA	Heavy snow and avalanche danger can restrict access to specific areas within the zone.	State DOT/PF maintains highways, including Richardson Road closures for drifting snow and avalanches that may increase response times.	NA
(b) (7)(F), (b) (3)		**MARITIME CLIMATE ZONE**					
Personnel	W –WC P – NA T -≤-35°F V - Fog, mist, white-out	High river velocities will impact response efficiency and increase safety requirements	Requires increased safety measures and will impact response efficiency.	Response efficiency impacted from November to February.	Aufeis requires special safety factors.	Road conditions SA-38, Section 5	Any combination of factors which threatens life safety.
Vehicles and Equipment	W - Blowing snow P – NA T -≤-35°F V - Fog, white-out	NA	NA	NA	Aufeis - safety factors.	Road conditions SA-38, Section 5	Break-up or icing conditions
Vac Trucks	W - Blowing snow, WC P – NA T -≤-35°F and O&M V - Fog, white-out	NA	Ice and debris will cut efficiency.	NA	Aufeis -safety factors	Road conditions	Freezing conditions

TABLE 3-4 (CONTINUED) CLIMATE MATRIX

Item Deployment	Weather Wind – W Precipitation – P Temperature – T Visibility - V	Tides/Currents River Velocities	Ice and Debris Breakup Freezeups	Daylight	Other Conditions Aufeis Permafrost Avalanche Drifting Snow	Remarks	Conditions that Could Preclude a Response
Aircraft Support	W - Limits @ > 40 knots P - Aviation Manual T -≤-40°F V - 1 mile or 300' C	NA	NA	Lack of daylight may require additional safety measures.	NA	NA	Ice log
Boats	W - O&M P – NA T -≤-35°F V - Fog impacts	Non-freezing conditions limited by motor output. Velocity impacts. Wave action impacts. O&M	Breakup impacts will reduce or preclude response actions.	NA	NA	NA	River currents, ice debris, and wave action
Boom	W - Effects from 10% P – NA T - Sub-zero temperatures V - NA	Effective at currents <2 knots or 3.5 fps or up to 5 - 7 knots using special techniques.	Not advisable during breakup and freezeup. Operation efficiencies reduced.	NA	NA	NA	Ice, debris, current, frozen conditions
Skimmer	W – Effected P – NA T - Sub-freeze and O&M V - NA	NA	Efficiency reduced	NA	Maintenance factor	NA	NA
Pumps	W –NA P – NA T - Sub-freeze and O&M V - NA	NA	Increased labor will be required to maintain.	NA	Maintenance factor	Road conditions *SA-38*, Section 5	NA

Key:

F	*Fahrenheit*
C	*Ceiling*
NA	*Not Applicable*
O&M	*Operation and Maintenance*
WC	*Wind Chill*

3.4.3 Realistic Maximum Operating Limitations Compensating Measures

Winds

None

Precipitation

None

Temperature

Of primary concern is low temperature. Alyeska has a minimum of 24 portable shelter and 22 portable heaters in its oil spill response equipment inventory to provide necessary protection to workers.

Visibility

None

Tidal Effects

None

Ice and Debris

In-situ burning is a viable response option in broken ice conditions. The ice tends to keep the oil in concentrations sufficient for combustion (greater than ¼" thick). Alyeska has the necessary equipment and expertise to conduct burning operations (refer to Volume 1, Section 1.7.3, “In-Situ Burning”).

Daylight Hours

Alyeska has 22 portable light towers in its oil spill equipment inventory for response operations during darkness.

River Velocities

Alyeska has identified 223 containment sites along the trans-Alaska pipeline route. A factor in determining location was the natural oil collection points in quiescent waters. In situations where river velocities exceeded safe operating limits, Alyeska would continue to monitor and track oil until an appropriate containment and recovery area presented itself.

Aufeis

Aufeis will not preclude a mechanical response but may slow it down with the need to implement procedures for the management and/or removal of the aufeis. Additionally, some tracked equipment may need to take an alternate route of travel to reach the spill site.

Permafrost

Response operations may need to be modified in certain areas to prevent longer term damage to permafrost areas.

Avalanches

The pipeline is buried at all potential avalanche locations to prevent damage to the pipeline. The Technica Risk Assessment (1990) considers the possibility of failure of the pipeline (oil spill) as the result of an avalanche to be negligible.

An avalanche potential survey would be conducted prior to initiating a response that posed a threat to the safety of personnel from avalanches. Avalanche risk could be managed through control techniques (shooting) and area avoidance measures. Avalanche zones that intersect or possibly affect the pipeline ROW have been mapped.

Alyeska maintains constant vigilance on physical environmental conditions that might impact the integrity of TAPS. If there is a threat, the necessary mitigating or compensating measures are taken. A specific example would be a river channel encroaching upon the pipeline right-of-way. Emergency river training structures may be constructed or strengthened to control river encroachment. If encroachment cannot be controlled, a decision may be made to shut-in the pipeline.

There are no special compensating measures in place for those periods when the realistic maximum operating limits for a mechanical response are exceeded. The pipeline was designed, built, and approved with compensating spill prevention measures incorporated for the operating environment.

3.4.4 Compensating Measures for Restrictions to Travel

To summarize, the most significant operating conditions which might impact the response to a spill will be weather conditions which present a threat to the safety of response personnel. The threats are high winds, causing low visibility due to blowing snow, drifting snow, and extreme cold temperatures from the wind chill effect.

If life safety of the responders is not an issue, there are options which can be exercised to at least partially overcome the difficulties presented. Transportation difficulties presented by heavy snowfall, drifting snow, or road closures due to avalanches can be dealt with in the following ways:

1. If, for example, an avalanche has made Atigun Pass impassable, responders would be deployed from the south. Response personnel and equipment could be flown over Atigun Pass from Prudhoe Bay, land at PS05/Prospect Response Base, and proceed north along the Dalton Highway to the spill scene.

2. If the depth of snow along the Dalton Highway, pipeline access road, or pipeline right-of-way impedes the passage of conventional vehicles, tracked all-terrain vehicles could be used to shuttle personnel and equipment to the containment sites. Track vehicles in Alyeska's inventory include Tucker snow cats, Bombardier tracked vehicles, snow machines, and four wheelers. Alyeska's contract helicopters could also be used alone or in conjunction with tracked vehicles to provide alternative transportation.

Tracked earthmoving equipment, such as dozers, could also be employed under their own power to proceed directly to the spill site and begin building snow berms for containment. Wheeled earthmoving equipment, such as road graders and front-end loaders will proceed to the spill site and begin snow clearing operations and establishment of containment.

3. Low visibility due to heavy snowfall, blowing snow, or general white-out conditions impeding transportation could be overcome by responding with resources from the area not impacted by those conditions. Since these types of conditions tend to be localized ground-based phenomena, aircraft could be employed to fly over or around the obstructing weather.

4. Other weather impacts to transportation in the form of heavy rains and bridge or road wash-outs could be overcome in a similar way. Mobilization of response resources from a different location in conjunction with aircraft transport are the most direct options.

3.4.5 Compensating Measures for Temporary Prevention and Response Relating to Non-Mechanical Response Actions

3.4.5.1 Prevention Measures

Risk Management and Safe Operating Requirements

While compensating measures for periods when the ability to respond to an oil spill would be diminished are designed into pipeline operations, additional condition-specific compensating measures can be taken.

Alyeska's risk management program provides a TAPS-wide structure for analyzing and mitigating risks, including oil spills, using a common framework and language. As part of the companywide risk mitigation, safe operating committee (SOC) reviews are required when personnel health and safety, environmental considerations, or pipeline operations are deemed at risk.

A safe operating committee is a multi-disciplinary team comprised of engineers, project managers, planners, supervisors, workers, safety professionals, and subject matter experts, brought together as needed to mitigate potential high-consequence activities, situations that present unique or unusual hazards such as potential oil spills, changes to established procedures, or emergency plans. The SOC reviews the risk potential and establishes engineered solutions, administrative controls, and additional safety requirements to perform work safely.

3.4.5.2 Response Measures

Alyeska is not proposing to use dispersants as a response measure. Measures to be taken to reduce the potential environmental consequences that may result from in situ burning include the implementation of an air monitoring surveillance program, to ensure the operation and smoke plume do not impact human populations, utilizing the USCG-recognized Special Monitoring of Applied Response Technology (SMART) procedures (Volume 3, Section 4.5.9), and implementation of a Burn Residue Collection tactic (Volume 3, Section 4.5.6.8).

3.5 LOGISTICAL SUPPORT [18 AAC 75.425(e)(3)(E)]

3.5.1 Transportation Equipment Inventory

A wide variety of resources are available for Alyeska in the event of a spill along the pipeline. Alyeska maintains a significant inventory of transportation equipment. It is important to note that the equipment list for total Alyeska assets is dynamic, changing as equipment is replaced or Alyeska chooses to lease equipment. Also, Alyeska relies on common carriers to do much of their heavy load road hauling. A contract is in place with Carlile Enterprises, which does the majority of the hauling. See Section 3.6, “Response Equipment.”

There are five helicopters positioned along the pipeline. These are stationed at Galbraith Maintenance Base, Prospect Response Base, Fairbanks, Glennallen Response Base, and Valdez. These aircraft are contracted from Maritime Helicopters. In the (b) (7) area, a helicopter can be obtained from Alaska Clean Seas via service agreements they have with Anchorage-based helicopter providers.

Through existing contracts or service agreements, Alyeska has access to the following types of aircraft:

- Boeing 737-200 – Northern Air Cargo
- Boeing 737-100 – Northern Air Cargo
- Shorts 330 Sherpa – Frontier Flying Service
- Dehaviland DASH 8 (passenger aircraft) – ERA Aviation
- Dehaviland Twin Otter (passenger aircraft) – ERA Aviation
- Helicopters (general) – Maritime Helicopters and ERA Aviation

Alyeska maintains on-site helicopters at five locations along the pipeline:

(b) (7)(F), (b) (3) (1) Bell 407 or equivalent

Bell 206 or equivalent

- Fairbanks: (1) Bell 407 or equivalent
- Glennallen Response Base/PS11: (1) Bell 407 or equivalent
- Valdez: (1) BO-105 or equivalent

These units are available for personnel transport and equipment slinging as needed.

(b) (7)(F), (b) (3)

The Bell 407 helicopters are rated as follows:

(b) (7)(F), (b) (3)

The Eurocopter BO-105CBS is rated as follows:

- Fuel capacity: 1,040 lbs (153 gal)
- Seating capacity: 1 pilot and 4 – 5 passengers
- Maximum sling load capacity: 1,000 lbs

TABLE 3-5 HELICOPTER EQUIVALENCY PARAMETERS

Helicopter	Maximum Rated Speed	Average Cruise Speed (No Wind)	Minimum Discretionary Load Capacity for Maximum Range (Excluding Maximum Fuel Contents, Pilot Weight, and Required Gear and Floats for BO-105)	Maximum Range (Within Fuel Reserve Requirements)
Bell 407 Equivalent	140 knots	115-120 knots	1,066 lb	250 nautical miles
Bell 206L-3 Equivalent	130 knots	100 knots	568 lb	230 nautical miles
BO-105 or equivalent	131 knots	110 knots	699 lb	260 nautical miles

Alyeska owns and maintains the following fleet of vessels to transport response equipment and personnel:

- 2 landing crafts,
- 15 conventional hull riverboats, and
- 14 airboats.

These vessels are distributed at response facilities linewide as described in Section 3.6, Table 3-7.

A discussion on the maintenance of this equipment is provided in Section 3.6.5, "Equipment Maintenance."

3.5.2 Field Operations Support Information

Alyeska maintains contracts for the daily operation and maintenance of the pipeline and for contingency purposes. These contractors have access to a large pool of personnel and equipment that may be used in the event of an emergency. Contractors and the services they would provide in an emergency are summarized in Table 3-6.

TABLE 3-6 ALYESKA CONTRACTORS

Company	Services Provided	Emergency Services
Ahtna	(b) (7)(F), (b) (3) [redacted]	Equipment and personnel
ASRC Energy Services —Houston Contracting Company, Inc.	Equipment maintenance, pipeline maintenance	Equipment, logistics support, and maintenance personnel
Chugach Alaska Services, Inc. (CASI)	Support staff	Support staff
CH2M HILL	Engineering services	Pipeline repair
Doyon Universal Services	Catering	Catering
Maritime Helicopters	Helicopter services	Helicopter services
Doyon Universal Services	Security	Security

3.6 RESPONSE EQUIPMENT [18 AAC 75.425(e)(3)(F)]

3.6.1 Location, Inventory, and Ownership of Equipment

Oil spill response equipment listed is for the purpose of responding to spills on or near the pipeline. Other spill response equipment available for use on a pipeline oil spill is located in Valdez/Prince William Sound and is listed in *CP-35-2, Valdez Marine Terminal Oil Discharge Prevention and Contingency Plan,* and *REF-PWS-TP-2012, Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan*. The equipment listed in this plan with a designation of Alyeska is owned and controlled by Alyeska Pipeline Service Company. The equipment listed in the referenced terminal and tanker plans is also owned and controlled by Alyeska.

Alyeska also uses Primary Response Action Contractors (PRACs) to augment its resources. A listing of PRACs is contained in Volume 1, Section 3.8, “Primary Response Contractor Information.” PRACs generally only provide personnel resources and would use Alyeska spill response equipment. Alaska Clean Seas Cooperative is the only PRAC providing both personnel and equipment. ACS owned and controlled equipment listed in equipment tables and referenced in oil spill scenario discussions is designated as ACS.

A list of the pipeline oil spill response equipment is provided in Table 3-7 through Table 3-10. Additional equipment information is provided in Table 3-11 through Table 3-23.

It is important to note that a portion of the equipment identified in this section is heavy construction type equipment. This equipment is utilized on a regular basis to meet Alyeska’s day-to-day operational needs. The equipment identified in the plan is normally restricted in its movement to the area between adjacent pump stations. The Joint Pipeline Office must be consulted if the equipment will be moved outside of this area prior to the move.

3.6.2 Storage Locations

Oil spill response equipment is primarily stored in the following locations:

- Oil Spill buildings and bull rails at each response base
- Fairbanks Response Base
- Remote conex locations
- 24', 26' winter, 26’ summer, and 45' oil spill trailers

3.6.2.1 Oil Spill Response Equipment Storage Procedure

This listing is intended to provide guidance in determining what oil spill response equipment (including recon equipment) needs to be stored indoors in a heated building, in a heated trailer (26' winter or 45'), outdoors plugged in at the “bull rail,” and outdoors in an accessible location during periods of cold weather. To ensure response readiness, cold sensitive equipment needs to be stored indoors, in a heated trailer (26' winter or 45'), or plugged in at the “bull rail” when ambient temperatures are 0 degrees F or colder.

3.6.2.2 Storage Determination

Indoors Warm/Heated Trailers

The need to have the piece of equipment start and be operational at a moment’s notice.

The equipment, by design or operating features, is cold sensitive and cannot be predicted to operate properly if stored at cold temperatures. Examples include vacuum trucks or equipment with attachments whose hydraulics would not be heated if plugged into the bullrail.

The equipment has been reasonably determined to be one of the first pieces of equipment to be dispatched and would be used in controlling, containing, and recovering spilled oil in almost all cold temperature response scenarios.

Outdoors Plugged In

The equipment can be started and idled to allow warm up or have heaters applied to make it ready for response as second-tier or later use.

The equipment will not be needed within the first hours of a response and can be prepared for use when needed.

Outdoors Cold Storage

This equipment is not cold sensitive, not needed in winter conditions, and can be stored in a way that it remains accessible for dispatch if needed at another location such as Valdez.

This equipment is not cold sensitive, may be needed in a winter response, and can be stored in such a way that it is immediately accessible for mobilization in the initial hours of a response.

Snow machines are stored outside during the winter at most response facilities. When temperatures reach -10°F, safety considerations mandate the use of tuckers in place of snow machines. Tuckers are kept indoors in warm storage year round.

To maintain access to the equipment, including snow machines, during the winter, the following prioritized actions are followed:

1. Maintain access to pump station/response facility.

2. Maintain access to facility equipment for snow removal (loaders, etc.)

3. Maintain access to reconnaissance equipment using loaders to remove snow and to pull equipment on trailers into position for use.

4. Check equipment at bull rails and cold storage and remove snow as needed.

5. If necessary, move heaters, light plants, and air compressors inside for thawing.

6. Maintain access to remote locations as time and road conditions allow.

Although cold storage is allowed, not all facilities choose to store snow machines outside. Where space allows, snow machines are stored in warm storage buildings, covered dry storage, or outside in covered snow machine trailers.

Note: *This listing is a minimum recommended listing and can be modified to address the unique operating environment or conditions of each pump station.*

Indoor warm storage or heated trailer equipment list:

- 1- end dump truck
- 1- vacuum truck
- 2- Tucker Track vehicles
- 1- D-6 dozer
- 1- semi tractor
- 1- 966 front end loader
- 1- roll back truck
- 1- Tioga heater
- 1- light tower
- 1- trencher
- skimmer pumps
- skimmer hydraulic power packs
- small generators
- small motorized hand tools
- 1- fire truck
- 1- ambulance
- 1- helicopter
- portable tanks and bladders (fabric)
- helitorch unit

Stored at bull rail:

- 1- end dump truck
- 1- push truck
- 1- D-8 dozer
- 1- dozer with backhoe
- 1- 14-G road grader
- 1- 930 front end loader
- 1- 980 front end loader
- 1- snow blower
- 1- crane
- 1- 235/245 backhoe
- 1- passenger bus
- 1- sand truck
- air compressors
- fuel spreader truck
- Suburban/crew cab trucks
- light plants
- Tioga Heaters
- 45' trailer
- 26' winter oil spill response trailer

Outside/inside cold storage accessible at all times:

- 24' river boom trailer
- sorbents
- culvert kits
- salvage drums
- portable shelters
- helicopter sling kits
- boats
- rope
- barricades
- hoses
- hand tools
- snowmachines (2)

A complete listing of the location of pipeline oil spill response equipment is provided in Table 3-7 and Table 3-8. It includes tables of equipment and locations.

3.6.3 Movement of Response Equipment/Non-Oil Spill Response Use of Equipment

3.6.3.1 Movement of Response Equipment

Oil Spill Response Equipment is strategically located along the pipeline to ensure that adequate resources are available to mobilize an initial response to a spill incident. The placement of this equipment recognizes the response mobilization challenges presented by mountain passes, road conditions, river bridges, weather influences to travel, and availability of alternate sources of equipment supplies.

A significant portion of the oil spill response equipment inventory identified in the equipment listing tables in this section is heavy earth moving, transport, and construction-type equipment. This equipment is used on a routine basis in support of pipeline facility and right-of-way maintenance, as well as pipeline project support work. Non-oil spill response use of the equipment is allowed, without prior knowledge and agreement from regulatory agencies, as long as the equipment remains available for oil spill response mobilization and it remains in its designated response area location.

Designated response area locations are defined as follows:

Pump Station/Response Base: Equipment listed in the equivalent tables under a pump station/response base location is restricted in its movement between the home base pump station and the pump stations to the north and to the south.

Area Wide: Equipment listed as “area wide” equipment is restricted in its movement between area boundaries. There are five designated areas defined below:



Line Wide: Equipment listed as “line wide” can be moved along the pipeline corridor from PS01 to the Valdez Marine Terminal.

3.6.3.2 Non-Oil Spill Response Use of Equipment

All oil spill response equipment can be used in support of oil spill response unannounced and announced response exercises outside its listed pump station/response base and area locations without prior notification to the agencies. Non-emergency or non-urgent use of the equipment for activities such as training or announced response exercises that will take the equipment out of its normal storage location for more than 24 hours will require a notification to the agencies before the equipment is moved outside its assigned area.

Project support use of heavy equipment is allowed without notification as long as the equipment remains in its assigned area and can effectively be recalled in response to an actual oil spill. If the equipment will be used outside of its assigned area or will be constrained in its ability to be recalled, a notification to the agencies prior to its use is required.

All equipment and materials will be returned in good operating condition to their assigned storage location/area as soon as practical following the event.

Listed equipment that becomes unavailable due to movement from its operating area or is found to be non-serviceable will be reported to the agencies as indicated in Section 3.6.5, “Equipment Maintenance” of this plan.

3.6.4 Equipment Specifications

Information on the specifications of the pipeline pumps and skimmers is provided in Table 3-9 and Table 3-10, respectively.

3.6.5 Equipment Maintenance

All Alyeska fleet units (owned, leased, and rented), including units identified as part of the OSCP inventory, are included in Alyeska’s Fleet Management software system called “Fleet Focus.” The preventive maintenance schedule varies depending on the type of equipment. Light vehicles, buses, and heavy trucks are serviced based on mileage. Operating equipment is tracked by engine hours. Some equipment is maintained on a calendar basis.

Weekly updates are made for all of the equipment. Based on these updates, “Fleet Focus” flags equipment due for service. When work is completed, it is entered into the computer, including the name of the technician completing the work and any parts used.

Smaller motorized, non-motorized equipment, response kits, and pallets of equipment are tested and/or inspected twice during a 12-month period. Equipment conexes are inventoried and inspected annually. The equipment in the conexes is function tested during the annual inventory and inspection. Equipment lists and testing, inspection, and maintenance are tracked in the Right-of-Way Maintenance Information System (ROWMIS).

If during the course of performing planned equipment maintenance, a piece of equipment is found to be non serviceable, it will be repaired or replaced immediately. If immediate repair or replacement of the equipment is not possible and the unavailability of the equipment would diminish oil spill response

capability, Alyeska will provide a written notice to the Alaska Department of Environmental Conservation (ADEC) and the Joint Pipeline Office (JPO) by facsimile or electronic mail within 24 hours of discovery.

The notice to ADEC/JPO will provide an explanation of the situation and a schedule for promptly returning the equipment to operational status.

Equipment breakdown and unscheduled repairs of equipment will be handled on a priority basis. If repairs or replacement are not possible within 24 hours, a notification to ADEC/JPO as described above will be made.

Planned maintenance of major response equipment items that will make them unavailable for response, without replacement, will only be done with prior approval of ADEC/JPO. A request will be submitted to ADEC/JPO identifying what measures will be taken to provide equivalent response capability, reduce the time out of service, or otherwise ensure that equivalent response capability is maintained.

TABLE 3-7 OIL SPILL EQUIPMENT – LOCATION ASSIGNMENTS

Equipment Style	Equipment Mode	AREA 1 DHMP 415-245 North Slope			AREA 2 DHMP 245-55 Koyukuk		AREA 3 DHMP 55 – RHMP 324 Interior			AREA 4 RHMP 324-149 Alaska Range		AREA 5 RHMP 149-0 Southern	SERVS Pipeline Response	Totals
		(b) (7)(F), (b) (3)												
		FACILITY LOCATIONS												
Passenger Vehicle	Light Vehicles	4		2	6	6	2	2	4	4		5		35
	Flat Bed (1-ton)	1	1	1	1	1	1	1	1	1	1	2		12
	Tow Vehicle ($^3/_4$-ton)	1		1	1	1	1	1	1	1	1	2		10
	Ambulance			1	1	1	1							4
Trucks	Tractor, Semi	1	1	1	1	1	1	1	1E	1	1	2		12
	End Dump	1	1	1	1	1F	1	1	1E	1	1	2		12
	Roll Back	1	1	1	1	1	1	1	1E	1	1	2		12
	Flat Bed (2-ton)											1		1
	Vacuum Truck	1	1	1	1	1	1	1	1E	1	1	1		11
	Fire Truck	D			1	1								2
Trailers	Hideck, 40-foot	1	1	1	1	1	1	1	1E	1	1	1		11
	45-foot Oil Spill Response Trailer	1	1	1	1	1	1	1	1E	1	1	2		12
	26-foot Winter Oil Spill Response Trailer	1	1	1	1	1	1	1	1I	1	1	2		12
	26-foot Summer Oil Spill Response Trailer	1	1	1	1	1	1	1	1I	1	1	2		12
	24-foot Oil Spill Response Trailer	1	1	1	1	1	1	1	1E	1	1	2		12
	Lowbed-Tag to 15-20T	1	1	1	1	1	1	1	1E	1	1	1		11
	Lowboy	1	1	1	1	1	1	1	1E	1	1	2		12

TABLE 3-7 (CONTINUED) OIL SPILL EQUIPMENT – LOCATION ASSIGNMENTS

Equipment Style	Equipment Model	(b) (7)(F), (b) (3)												Totals
Loaders/ Equipment	Cat 966 w/Balderson Attachment/Equiv.	1	1	1	1	1	1	1	1E	1	1	1		11
	Cat 930 Forklift/Equiv.	1	1	1	1	1	1	1	1	1	1	2		12
Track Equipment	Dozer D-3/HOE/ Hitachi 75 mini excavator or Equiv.	1	1	1	1	1	1	1	1E	1	1	1		11
	Cat D-6 or Equiv.	1	1	1	1	1	1	1	1E	1	1	1		11
	Tucker ATV	2	2	2	3	4	2	3	1 PS08, 2 NDY	3	4	4		32
	Snow Machine w/trailer	2	2	2	2	2	2	2	2N	2	2	4		24
Boats & Marine Equipment	Land Craft w/trailer						2							2
	Riverboat w/trailer	0	0	0	0	1	2	1	2E, N	1	1	3		11
	Airboat/trailer	1Q	1Q	2	2	1	1	1	1E	1	1	3	1	16
	Boat w/o trailer								1A					1
	Line, ½" or 5/8" (feet)[G]	6,000	5,000	5,000	4,000	3,000	6,000	1,000	2,000/1,000A	3,000	4,000	7,000		42,000
45' Oil Spill Trailer	Inflatable Rafts	1	1	1	1	2	1	1	1E	1	1	2		13
Heaters Fr. Air w/ 50-foot flex hose	Space 250Btu/Equiv.	1	1	1	1	1	1	1	1E	1	1	2		12
	Space 500Btu/Equiv.	1	1	1	1	1	1	1	1E	1	1	1		11
ATV	4- or 6-wheeler	2			2	2	2		2	2		2		14
Light Tower	Light Tower/Plant	2	2	2	2	2	2	2	1E	2	2	3		23
Compressors w/100foot hose	Compressor, 185 CFM	1	1	1	1	1	1	1	1E	1	1	1		11

TABLE 3-7 (CONTINUED) OIL SPILL EQUIPMENT – LOCATION ASSIGNMENTS

Equipment Style	Equipment Model	(b) (7)(F), (b) (3) [redacted]	Totals
Miscellaneous Equipment	Pressure Washer	1 1 1 1 1 1 1 1E 1 1 1	11
	Generator 2 KW/Equiv.	2 2 2 2 2 2 2 2 2 2 4	24
	Portable Shelters [H]	2 2 2 2 2 4 2 2EF 2 2 4	26
	MegaSecur Dam [P]	2 2 2 2 2 2 2 2 2 2 4	24
	Shallow Water Boom Vanes	1 1 1 1 1 3 8 8	24
AREA WIDE LOCATIONS			
Trucks	Fuel Truck	1 1 1 1 1	5
	Mechanic Truck	1 1 1 1 1	5
	Push Truck	1 1F 1B	3
Track Equipment	Dozer D8/D9	1 1 1B 1 1 VDZ	5
LINE WIDE LOCATIONS			
Support	Helitorch	1 1 VDZ	2
	Mobile Camp (MCCF100)	1	1
	8,000-gal Helicopter Fuel Tank	1 1K 1L 1 1M See Footnote O	5
	Mobile Command Post	1E	1
	Wildlife Modules	1 ACS 1E 1 VDZ	3
	Snow Melter	1 (BP or ConocoPhillips) 1E	2

TABLE 3-7 (CONTINUED) OIL SPILL EQUIPMENT – LOCATION ASSIGNMENTS

Equipment Style	Equipment Model	(b) (7)(F), (b) (3)	Totals
Support (continued)	Vacuum Units	1E 1 2
	Crane 17 ton +	1 1 1B 1 1 VDZ 5
	Backhoe 235/245/450	1 1 1B 1 1 VDZ 5
	Wash Van	1 ACS 1B 1 VDZ 3
	Bus (20-40 pass)	1 1B 1 1 VDZ 4
	Trencher	1 1 1E 1 1 5
	Helicopter	1 1 1J 1 1 5
	Fire Foam Skids	4 1 5
	Communications Modules	1 1E, MCP 2

Notes: *Pipeline Civil and Maintenance Coordinators at each pump station track assigned area equipment.*

A. At Ft. Wainwright
B. Located at Van Horn shop
C. Equipment non-oil spill use limited to north side of Yukon River MP 351.
D. Provided by North Slope Mutual Aid partners.
E. Nordale Yard
F. One End Dump that also has Push Truck capabilities.
G. These totals include quantities in kits, pallets, trailers, and pump station facilities.
H. Portable Shelter contents are listed in Table 3-11, "Palletized Equipment."
I. See Section 3.6.2
J. Maritime Helicopters
K. Galbraith Airport
L. Prospect Creek Airport
M. Delta Heliport: Tank is 6,000 gallons.
N. Boats and boat trailers are stored at PS08 from approximately October to May. Snowmachines and trailers are stored at PS08 from approximately May to October.
O. No Alyeska owned or leased tank at this facility. Alyeska has a fuel contract with commercial supplier.
P. MegaSecur dams located in 45' and 26' Summer trailers (1 each).
Q. PS01 and PS02 airboats are stored at PS03 during winter season.

TABLE 3-8 OIL SPILL EQUIPMENT – STORAGE LOCATIONS AND QUANTITIES

(b) (7)(F), (b) (3)													SERVS	Total[2]
Miscellaneous Materials														
Pump Station	Wildlife Hazing Kit	1	—	—	1	1	1	—	1[1]	—	—	1		6
Pump Station	Fence Posts, Steel	75	—	75	50	50	50	50	50	50	50	50		550
Pump Station	M kko Patch Kit, Magnetic	1	—	1	1	1	1	1		1	—	1		8
Pump Station	Ice Cutting Frame, Sled	1	—	1	1	1	1	1	1	1	—	1		9
Pump Station	Visqueen, Reinforced, Roll	20	20	20	20	20	20	20	20	20	20	20		220
Pump Station	Reconnaissance Box [1]	3	2	4	3	5	3	3	3	3	4	4		37
Pump Station	CMP 18" × 20' w/Bands	4	—	4	4	4	4	4	4	4	4	4		40
Pump Station	CMP 24" × 20' w/Bands	4	—	4	4	4	4	4	4	4	4	4		40
Lumber Pallet		1	—	1	1	1	1	1	1	1	1	1		10
Mobile Units	Wildlife Stabilization Units	1	—	—	—	—	—	—	1	—	—	—	1	3
Skimmers														
Oil Spill Trailer	Pedco Weir, 2'	1	1	1	1	1	1	1	1	1	1	1	1	12
Oil Spill Trailer	Elastec TDS-118G Groove	1	1	1	1	1	1	1	1	1	1	2	—	12
Pump Station	Pedco Weir, 4'	—	—	1	—	1	—	1		1	—	1		5
Pump Station	[4]Rope Mop Pallet	1	1	1	1	1	1	1	1	1	1	2		12
Oil Spill Trailer	Manta Ray Skimmer	2	1	2	1	2	2	2	1	2	3	3		21
Pump Station	[4]Skim Pak	1	1	1	1	1	1	1	1	1	1	1		11
Pump Station/Trlr	Aqua Guard (brush/disc or drum)	2	1	2	2	2	2	2	2	2	2	4	1	24
Pump Station	[2]Komara Disc Skimmers or equivalent	1	—	—	1	1	1	—	1	1	—	2		8
Boom														
Pump Station	Fire Boom	196	196	196	196	196	196	196	196	196	196	196		2156
Pump Station/Trlr	Boom/ft (does not reflect Remote Conex); Total Footage	4379	3100	4400	3800	2600	5400	800	2300	3400	2100	3700		35979

TABLE 3-8 (CONTINUED) OIL SPILL EQUIPMENT – STORAGE LOCATIONS AND QUANTITIES

(b) (7)(F), (b) (3)

Storage														
Pump Station/Trlr	Open Top Tanks/Bladders (in 1000s of gallons)	103	46	114.6	120.4	84	104	43.8	116.9	110.8	57.8	106		1007.3
Pump Station	Drum, 55 Gallons	20	20	20	20	20	20	20	20	20	20	20		220
Sorbents														
Pump Station/Trlr	Blanket (rolls)	10	10	10	10	10	10	10	10	10	10	12		112
Trailer	Boom (bales)	5	5	5	5	5	5	5	5	5	5	7		57
Trailer	Pads (bales, 100 ct/bale)	10	10	10	10	10	10	10	10	10	10	12		112
Pumps[2,3]														
Pump Station	Pump, centrifugal, 3" or 4"	1	1	1	2	1	2	1	2	1	1	3	0	16
Pump Station	Pump, diaphragm, 3" or 4"	2	1	1	2	2	3	2	4	2	2	3	0	24
Pump Station	Pump, centrifugal or peristaltic, 2"	1	1	1	2	1	1	1	2	2	1	2	0	15
Pump Station	Pump, diaphragm or peristaltic, 2"	4	3	3	4	4	4	3	4	4	3	7	0	43
Pump Station	Pump, hand diaphragm, 2"	1	1	1	1	1	1	1	1	1	1	1	0	11
SERVS -VDZ	Pump, centrifugal - hydraulic, 6"	—	—	—	—	—	—	—	—	—	—	—	6	6
SERVS - VDZ	Pump, screw - DOP 250, 6"	—	—	—	—	—	—	—	—	—	—	—	4	4
SERVS - VDZ	Pump, Vacuum Ro-Vac	—	—	—	—	—	—	—	—	—	—	—	3	3
Hose[2,3]														
Pump Station	Hose, suction, 3" or 4" (ft.)	400	400	200	400	400	400	400	400	200	400	400	0	4000
Pump Station	Hose, discharge, 3" or 4" (ft.)	200	200	200	200	200	200	200	200	200	250	450	0	2500

TABLE 3-8 (CONTINUED) OIL SPILL EQUIPMENT – STORAGE LOCATIONS AND QUANTITIES

(b) (7)(F), (b) (3)

Pump Station	Hose, suction, 2" (ft.)	400	400	400	400	400	400	400	400	400	400	800	0	4800
Pump Station	Hose, discharge, 2" (ft.)	200	200	200	200	200	200	200	250	100	250	650	0	2650

Notes:
1. Wildlife Hazing Kit kept with Security and the Doyon Industrial Facility in Fairbanks.
2. These totals include quantities in kits, pallets, trailers, and pump station facilities.
3. 2" peristolic pumps may be substituted for 2" centrifugal or diaphragm pumps.
4. See Table 3-11, "Palletized Equipment."

TABLE 3-9 PUMP SPECIFICATIONS

(b) (7)(F), (b) (3)

TABLE 3-9 (CONTINUED) PUMP SPECIFICATIONS

[redacted]

Vacuum Truck, 3,800 and 4,200 gallon capacity[1]	Truck mounted vacuum system	Diesel Truck & Chassis, steel tank, insulated, vacuum pump/blower, with product thaw loop	Six wheel drive truck, 19.1 ft x 6 ft tank	GVW 67,000 lbs	I, II, III, IV, V	(Dependent on lift, viscosity and hose length) up to 100 gpm	20 gpm	Not available	Not available	Debris Resistant	Alyeska/Pump Stations - Valdez	14
Vacuum skid, 600 gallon tank	self contained vacuum skid system	skid tank, diesel drive engine, vacuum pump/blower	4 ft x 5.2 ft x 10.1 ft	2,900 lbs	I, II, III, IV, V	(Dependent on lift height, viscosity and hose length), up to 50 gpm	10 gpm	Not available	Not available	Debris Resistant	Alyeska/Pump Stations	3
Vacuum system, Ro-Vac MK II	portable vacuum system	Diesel engine 13.4 hp, transfer pump, vacuum pump on a 2-wheel trailer	5.2 ft x 4 ft x 4.1 ft	1,540 lbs	I, II, III, IV, V	(Dependent on lift viscosity, and hose length), up to 2000 bbl/hr	400 bbl/hr	Not available	Not available	Debris resistant	Alyeska/SERVS - Valdez	3

[1] *Maximum highway load limit, without waiver approval, is 3,000 gallons.*

TABLE 3-10 SKIMMER SPECIFICATIONS

Description	Type	Components	Dimensions	Dry Weight	Oil Type(s)	Manufacturer's rated Capacity	De-rated Capacity (20%)	Tested Capacity	Recovery Efficiency	Debris Handling	Ownership/Storage location	Amount in Inventory
Aquaguard RBS-5 Brush/Drum Skimmer	Oleophilic	a) Floating skimmer head with brush/drum cassette, b) Diesel hydraulic power pack, c) diesel diaphragm transfer pump, d) Suction & discharge hose kit	a) 2.4 ft x 3.0 ft x 0.5 ft b) 2.0 ft x 2.0 ft c)2.1 ft x 2.0 ft d) 3.0 ft x 3.0 ft	a) 90 lbs b) 105 lbs c) 115 lbs d) 55 lbs	I, II, III, IV, V	c) 75 gpm	c) 15 gpm	c) 75 gpm with Type III oil	95%	Not affected	Alyeska/Pump Stations	15
Elastec TDS-118 Drum Skimmer	Oleophilic	a)Aluminum, 2 drum floating skimmer head b) diesel hydraulic power pack and transfer pump c) hose kit	a) 3 ft x 4 ft x 2 ft x 0.3ft draft \ b) 2.5 ft x 3.0 ft x 2.0 ft	a) 50 lbs b) 150 lbs	I, II, and IV	15 - 35 gpm on types I-III oil	3 - 7 gpm	15 - 35 gpm on types I-III oil	95% - 97%	Not affected	Alaska Clean Seas Co-op/Prudhoe Bay	2
Elastec TDS-118G Groove Drum Skimmer	Oleophilic	a)Aluminum coated with Neoprene/Hypalon, 2 drum floating skimmer head b) diesel hydraulic power pack and transfer pump c) hose kit	a) 3 ft x 4 ft x 2 ft x 0.3ft draft \ b) 2.5 ft x 3.0 ft x 2.0 ft	a) 60 lbs b) 150 lbs	I, II, and IV	70 gpm on types I-III oil	14 gpm	70 gpm on types I-III oil	95%	Not affected	Alyeska/Pump Stations	10
Komara 12 k Disc Skimmer	Oleophilic	a) Floating circular skimmer head with integral discharge pump b) diesel hydraulic power pack c) hose kit	a) 4 ft diameter x 8 inch draft b) 2.3 ft x 2.5 ft c) n/a - as assigned	a) 115 lbs b) 145 lbs	I, II	a) pump @ 113 gpm	a) 22.6 gpm	100 gpm with Type I and II oil	95%	Debris Resistant	Alyeska/Pump Stations	12

TABLE 3-10 (CONTINUED) SKIMMER SPECIFICATIONS

Description	Type	Components	Dimensions	Dry Weight	Oil Type(s)	Manufacturer's rated Capacity	De-rated Capacity (20%)	Tested Capacity	Recovery Efficiency	Debris Handling	Ownership/Storage location	Amount in Inventory
CSI, MW-41 Rope Mop, 4 Inch, Electric, Drum Mount	Oleophilic	a) Electrical (115/120 vac) drive head and squeeze rollers and 100ft to 200ft mop with floating return pulley b) portable generator c) transfer pump	a) 2.0 ft x 1.0 ft x 2.0 ft b) 2.0 ft x 2.5 ft x 3.0 ft c) depends on pump 2-3 inch diaphragm recommended	a) 165 lbs	I, II, III	7 gpm	1.4 gpm	7 gpm with type II oil	95%	Debris Resistant	Alyeska/Pump Stations	12
Slickbar Manta Ray	Weir	Floating Skimmer head, flexible and rigid	2 ft x 4 ft semicircular x 0.3 ft draft	26 to 58 lbs	I, II, III	120 gpm - 150gpm depending on attached pump	24 - 30 gpm	24 - 35 gpm with Type I and III oil	11 - 45%, better results in thick oil layers	Debris sensitive	Alyeska/Pump Stations	12
Skim-Pak 2200 SH	Weir, flow controlled/self adjusting	a)Fiberglass, floating weir skimmer, self adjusting b) diesel diaphragm 2-3 inch pump c) hose kit	a) 1.5 ft x 1.6 ft x 0.5 ft draft b) pump dependent	a) 15 lbs b) pump dependent	I, II	5 - 38 gpm	1 - 7.6 gpm	Not available	Not available	Sensitive to small debris, resistant to large debris	Alyeska/Pump Stations	11
Pedco 2 Foot Weir Skimmer	Weir, self adjusting	a) Floating aluminum weir skimmer head b) 2-3 inch diesel diaphragm transfer c) hose kit	a) 3.5 ft x 3.3 ft x 2.5 ft x 1.3 ft draft b) pump dependent	a) 87 lbs b) pump dependent	I and II	78 gpm	15.6 gpm	Not available	Not available	Debris resistant with debris screen at weir lip	Alyeska/Pump Station	22
Pedco 4 foot Weir Skimmer	Weir, self adjusting	a) Floating aluminum weir head b) diesel diaphragm 2-3 inch transfer pump c) hose kit	a) 5.5 ft x 6.4 ft x 2.5 ft x 1.3 ft draft b) various c) various	a) 122 lbs b) depends on pump selected	I and II	840 gpm	168 gpm	Not available	Not available	Debris Resistant with screen at weir lip	Alyeska/Pump Station	5

TABLE 3-10 (CONTINUED) SKIMMER SPECIFICATIONS

Description	Type	Components	Dimensions	Dry Weight	Oil Type(s)	Manufacturer's rated Capacity	De-rated Capacity (20%)	Tested Capacity	Recovery Efficiency	Debris Handling	Ownership/Storage location	Amount in Inventory
DESMI 250 Weir Skimmer	Weir Skimmer, remote adjusting	a) Floating weir skimmer head with integral screw pump b) diesel hydraulic power-pack and air compressor c) hose kit	a) 6.6 ft x 7.4 ft x 2.4 ft x 2.0 ft draft b) 6.7 ft x 3.5 ft x 5.1 ft	a) 375 lbs b) 4,000 lbs	I, II, III, IV	440 gpm	88 gpm	Not available	Not available	Alyeska/SERVS/Valdez	11	

TABLE 3-11 PALLETIZED EQUIPMENT

Recon Box	Portable Shelter Kit	Fire Boom Kit	300' Boom Pallet	Rope Mop Pallet	Skim Pak Kit	Lumber Pallet
1 ea. 20' x 100' Reinforced visqueen	12' × 10' × 7' Portable arctic shelter	**Kit A**	300' of Boom	1 ea. Rope mop power head	Skim-Pak Skimmer	20 ea. Plywood, 3/4" × 4' × 8' Sheets
1 ea. Spade shovel	6 ea. Conduit welded tee	3 sections Fire boom	10 ea. Rope bags ½" or 5/8", minimum 500' total	1 ea. Down hole attachment	Diaphragm Pump	20 ea. 2" × 4" × 8'
1 ea. Bolt Cutters	1 ea. Lightweight 6' dome tent	4 ea. ¼" chain 50' lengths	Boom anchor bridles	1 ea. Float pulley	2" × 50' Lay flat discharge hose	20 ea. 2" × 6" × 8'
1 ea. Double faced rubber mallet	1 ea. Portable shelter outer cover	10 ea. Pear shape stainless steel snap rings 15/16"	1 bridle per boom section plus one spare bridle	1 ea. Rope Mop 100'	1.5" × 25' Suction hose	20 ea. 2" × 8" × 8'
1 ea. pkg. Sorbent pads	1 ea. Interior liner	2 ea. Rope bags ½", 200' minimum	2 ea. Boom tow plates w/bridles	1 ea. Rope Mop 200'	Wand and valve assembly	50 ea. Stakes, Wood, 1" × 2" × 2'
1 ea. 50' Rope bag w/snaps or rings on each end	16 ea. 12" Bridge spikes	5 ea. Steel stakes approx. 1" dia. × 3'	4 ea. Spare boom connector spring pins	1 ea. 2" Ball valve assembly		
1 ea. Linesman pliers	12 ea. 1" × 29" Conduit spacer	2 ea. Sledge hammer	15 ea. Carabiners	4 ea. Tent stakes		
2 ea. Roll mechanics wire	1 ea. 13" 4# Sledge hammer	2 ea. Fire boom SS tow plates w/bridles & float	10 ea. Ascenders	1 ea. Barrel with lid and clamp		
1 ea. Double-faced sledge hammer, 6#	10 ea. Conduit arch	5 ea. Anchors	5 ea. Pulleys			
1 ea. Mattocks pick	1 ea. Tend door end cover	1 ea. Duckbill anchor driver	Anchors, 1 anchor per section			
1 ea. Tin snips	12 ea. 12" Plastic tent stakes	10 ea. Stainless steel bolts 3/8" × 1"	1 ea. Duckbill Driver			
1 ea. Bow saw	2 ea. Single stub frame	10 ea. Stainless steel locking nuts				
1 ea. Belt axe hatchet	2 ea. Double stub frame					
1 ea. Double- or single-faced axe	2 ea. Left corner frame	**Kit B**				
1 ea. 28" dia. plywood culvert plug	2 ea. Right corner frame	4 sections Fire boom				
12 ea. Wooden lathe, 30"	10 ea. Bottom arch					
2 ea. Orange survey tape	3 ea. 50' Nylon parachute cord					
1 ea. Snow shovel	2 ea. roll Self adhesive weather strip					
	4 ea. RIO insulation panels					
	1 ea. Tent instruction manual					
	1 ea. Tent back cover					
	9 ea. Cross member connections					

TABLE 3-12 CONTINGENCY COMMUNICATIONS EQUIPMENT

System	Quantity	Location
Air-Ground Radios	2	Fairbanks (1) Valdez (1)
Generators, 13 kW	2	Fairbanks (1) Valdez (1)
Indoor Equipment Unit (IEU), consisting of: • 8' ×8' portable shelter (MCM)	2	Fairbanks (1) Valdez (1)
Modem, RF	2	PS09 (1), PS05 (1)
Mobile Command Post • Shelter, 8' × 24' • Oil Spill Repeater (Portable 3-watt VHF Repeater) Satellite Phones (Wall-Mounted) • Control Station - VHF • A/G radio • Land – VHF (100 Channel Wall-Mounted in Dispatch) • AT&T Microwave System • Video Conference System	1 1 1 8 1 1 2 1 1	Fairbanks
Portable Inmarsat Terminal	1	Anchorage (1) Valdez (1)
Portable Radios – Motorola XPR 6550	60	Valdez
Portable Radios – Motorola XPR 6550	240	Pipeline (140) Valdez (100)
Portable Repeaters VHF – VHF 30 watt (Daniels ET-6)	2	Fairbanks (spares)
Portable Repeaters VHF – UHF 30 watt (Daniels ET-3)	3	PS01, 05, Fairbanks
Suitcase Repeaters VHF – VHF 30 watt (Daniels ET-6)	14	Pipeline (10) at PS01, 02, 03, 04, 05, 06, 07, 09, & GRB/12 SERVS (2), MCP (1), VMT (1)
Radio Base Station – VHF 50 watt (Bag Radios – Orange Case)	6	Fairbanks (4), MCP (2)
Satellite Phones	15	45' Oil Spill Trailers (9), MCP (6)
TMS Compact	1	Valdez (1)
Telephone Switch	1	Anchorage (1)
Video Teleconference	4	Anchorage, Fairbanks, Valdez, MCP

TABLE 3-13 DAMAGED OIL STORAGE TANK PRODUCT TRANSFER FITTINGS[1]

PS01	PS03	PS04	PS05	PS07	PS09	PS12
2 ea. 6" Bolted Flange - 3" Camlock Fitting	2 ea. 6" Bolted Flange - 3" Camlock Fitting	1 ea. 6" Bolted Flange - 3" Camlock Fitting	1 ea. 6" Bolted Flange - 3" Camlock Fitting	1 ea. 6" Bolted Flange - 3" Camlock Fitting	8 ea. 3" Threaded - 3" Camlock	1 ea. 6" Bolted Flange - 3" Camlock Fitting
1 ea. 3" Bolted Flange - 3" Camlock Fitting	2 ea. 3" L's - 3" Camlock Fitting	1 ea. 4" Bolted Flange - 4" Camlock Fitting	1 ea. 4" Bolted Flange - 4" Camlock Fitting	1 ea. 4" Bolted Flange - 4" Camlock Fitting	1 ea. 2" Bolted Flange - 2" Camlock Fitting	1 ea. 4" Bolted Flange - 4" Camlock Fitting
2 ea. 3" L's - 3" Camlock Fitting	120' of 3" Hose	1 ea. 3" Bolted Flange - 3" Camlock Fitting	1 ea. 2" Bolted Flange - 2" Camlock Fitting	3 ea. 2" Bolted Flange - 2" Camlock Fitting	1 ea. 1/2" Pipe Thread - 2" Camlock Fitting	1 ea. 3" Bolted Flange - 3" Camlock Fitting
2 ea. 4" to 3" Camlock Reducer	1 ea. 3" Transfer Pump	1 ea. 2" Bolted Flange - 2" Camlock Fitting	2 ea. 3" - 2" Camlock Reducer	3 ea. 3" - 2" Camlock Reducer	2 ea. 6" Bolted Flange - 3" Camlock	1 ea. 2" Bolted Flange - 2" Camlock Fitting
120' of 4" Hose		1 ea. 4" - 3" Camlock Reducer	140' of 3" Hose	300' of 3" Hose	2 ea. 3"-L-3" Camlock Fitting	1 ea. 4" - 3" Camlock Reducer
1 ea. 3" Transfer Pump		1 ea. 3" - 2" Camlock Reducer	1 ea. 3" Transfer Pump	1 ea. 3" Transfer Pump	120' of 3" Hose	1 ea. 3" - 2" Camlock Reducer
		160' of 3" Hose		1 ea. 4" - 3" Camlock Reducer	1 ea. 3" Transfer Pump	160' of 3" Hose
		1 ea. 3" Transfer Pump		1 ea. 3" Bolted Flange - 3" Camlock Fitting		1 ea. 3" Transfer Pump

[1] Part of total inventory of hose requirement.

TABLE 3-14 24' RIVER BOOM TRAILER

Description	Quantity	Unit
Boom Anchor Plates, Aluminum w/ shackles	6	each
Boom, Fastwater, 6" x 4" x 33'	1782	ft
Trailer Equalizer Hitch	1	each
Chock Blocks	2	each
Sorbent Boom	20	feet
20-ft. x 100-ft. Reinforced Visqueen	4	rolls
½" x 300-ft. Nylon Rope	2	spools
Safety Glasses	4	each
Goggles	4	each
Duct Tape	2	rolls
Electrical Tape	2	rolls
Flashlights with Batteries	2	each
Respirators	4	each
Rubber Insulated Gloves	4	each
Nitrile Gloves	4	each
Ear Plugs	1	box
Rain Gear	4	each
Boots, Hip, Rubber, w/Safety Toe, Non-Insulated	4	each
Tyvek Suits	4	each
Personal Flotation Devices	4	each
Tool Kit	**1**	**kit**
• 8" or 10" Adjustable Wrench	2	each
• 2-oz. Ballpeen Hammer	2	each
• Hack Saw	1	each
• Replacement Hack Saw Blades, medium tooth	2	each
• Utility Knives	2	each
Boom Accessories Kit	**4**	**kit**
• Storage Container	1	each
• Rope Bags, 1/2" Diameter, 50'L minimum for each bag	10	each
• Steel Stakes, Approx. 1" x 3-ft.	10	each
• Boom Anchor Bridles	10	each
• Tow Bridles, Fastwater Boom	2	each
• Spare Boom Connector Pins	4	each
• Duckbill Anchors	10	each
• Carabiners, D Aluminum 3/8" x 4"L, 4400# or greater	15	each
• Ascenders, Petzel, Ascension	10	each
• Pulleys, Climbing/Pulling, Rope, 4.5" x 2.5", for 16mm rope	5	each
• Duckbill Driver, 3/4" size stored outside of Boom Accessory Kit box	1	each
• Sledge Hammer 8-lb. stored outside of Boom Accessory Kit box	2	each
• Rebar caps	10	each
• 1/2 inch Clevis (shackle)	6	each

TABLE 3-15 26' SUMMER TRAILER

Description	Quantity	Unit
Boom, Fastwater, 6" x 4" x 33', 10 sections	330	ft
Fire Extinguisher	1	each
Spare Tire	1	each
8 b sledge hammer	2	each
Personal Flotation Devices, Assorted	5	each
Hip Boots, Assorted	7	each
Pump, Centrifugal, 2", Diesel, Yanmar, Pedco Skimmer	1	each
Boom Anchor Plates, Aluminum w/schackles	3	each
Dam, Portable, Megasecur 21"	1	each
Tent, Arctic Oven 10 X 20	1	each
anchor stakes	25	each
5 gallon safety #1 diesel can (full)	2	each
Power Pack, hydraulic, GP7, Vikoma	1	each
Skimmer, Oleophilic, Elastec TDS118 Grooved Drum	1	each
Tank, Fast Tank, 1200 Gallon	4	each
bags, oil waste	2	box
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Sorbent, Pads, Bale of 100	4	each
Visqueen, Reinforced, 10mil, 20' x 100' Roll	1	roll
Sorbent Boom in Clear Bags, 10'L (8 sections)	80	ft
Hose, Suction Discharge, 2in x 18ft, Caps & Plugs, 12ea, 25lbs	216	ft
4' Step Ladder	1	each
Sorbent, Rolls, 38" x 144"	1	each
18 volt Dewalt Drill, cordless and drill index	1	each
dolly, two wheel w/fold down nose	1	each
wheel chocks	2	pair
containments, f/power packs	2	each
Trailer Steps (removable)	1	Each
Kit, Boom Accessories	**1**	**kit**
• Storage Container	1	each
• Rope Bags, 1/2" Diameter, 50'L minimum for each bag	10	each
• Steel Stakes, Approx. 1" x 3-ft.	10	each
• Boom Anchor Bridles	10	each
• Tow Bridles, Fastwater Boom	2	each
• Spare Boom Connector Pins	4	each
• Duckbill Anchors	10	each
• Carabiners, D Aluminum 3/8" x 4"L, 4400# or greater	15	each
• Ascenders, Petzel, Ascension	10	each
• Pulleys, Climbing/Pulling, Rope, 4.5" x 2.5", for 16mm rope	5	each
• Duckbill Driver, 3/4" size stored outside of Boom Accessory Kit box	1	each
• Sledge Hammer 8-lb. stored outside of Boom Accessory Kit box	2	each
• Rebar caps	10	each

TABLE 3-15 (CONTINUED) 26' SUMMER TRAILER

Description	Quantity	Unit
• 1/2 inch Clevis (shackle)	6	each
Kit, Helicopter Sling	**1**	**kit**
• Safety Goggles	2	each
• Ear Plugs	12	pair
• Boat Crew Helmet	2	each
• Lineman OR Rubber Insulated Gloves	2	pair
• 10-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
• 20-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
• Cargo Nets, approx 20-ft. x 20-ft.	2	each
• 3/4 inch shackles	2	each
Kit, Decon, 85 Gal Salvage Drum	**1**	**kit**
• Barricade, Easel W/O Barricade Light	1	each
• Dry Erase Board, approximately 24" x 18" w/Markers and Eraser	1	each
• PVC Ground Cloth/Liner, approximately 6-ft. x 18-ft. Ortla Liner	1	each
• Wash Brushes, Long Handle	2	each
• Containment, flexible portable 24"X24" minimum	1	each
• Protective Hand Lotion, minimum of 8-oz size	1	bottle
• Water Cooler, 5-gallon	1	each
• Bottle of 409 Spray Bottle	1	each
• Insect Repellent	2	each
• Flashlights, D-Cell Type	4	each
• D-Cell Batteries for Flashlights	16	each
• pH Meter Paper w/Charts	1	pack
• Paper Towels	2	rolls
• Duct Tape, 2" or 3"	5	rolls
• First Aid Kit, 16 Unit	1	each
• Fire Extinguisher, 10# Dry Chemical	1	each
• Flagging Tape, Orange	2	rolls
• Round Point Shovels (found in Tool Barrel)	2	each
• Sorbent Pads, 50 count	1	each
• Clear Bags, 35-gallon minimum	25	each
• Goggles, Antifog, Splashproof	4	each
• Eye Rinse Solution, minimum of 16-oz. for each bottle	2	bottles
• Safety Glasses	4	each
• Ear Plugs	1	box
• Disposable Respirator, size LG, 3M	1	each
• Disposable Respirators, size MED, 3M	3	each
• Polar Gloves, Winter Foam Lined	4	pair
• Nitrile Gloves	1	box
• Neoprene Gloves	4	pair
• Green Ape Gloves, Cotton	4	pair
• PVC Disposable Gloves, Powdered, 6.5 Mil, size LG	1	box

TABLE 3-15 (CONTINUED) 26' SUMMER TRAILER

Description	Quantity	Unit
• Rain Pants, Bib, Yellow, size XL	4	each
• Rain Jackets, Yellow Hood w/ Buttons, size XL	4	each
• Disposable Tyvek Coveralls, Yellow	4	each
• Latex Overboot Covers, size XL	4	each
• Folding Chair	1	each
Tool, Kit	**1**	**kit**
• Contico Tool Box approximately 26in x 8.75in x 10.5 in	1	each
• ¼in and 3/8in Drive Socket Set	1	each
• Combo Screw Driver Set	1	each
• 6in Adjustable wrench	1	each
• 8in Adjustable wrench	1	each
• Channel Lock Pliers	1	each
• Ball peen hammer - 12 oz	1	each
• Locking pliers - long nose	1	each
• Set Combination wrenches	1	each
• Hex Wrench Set STD, folding	1	each
• Hex Wrench Set Metric, folding	1	each
• Set, Pliers, Lineman, needle nose, diagonal wire cutter	1	each
• Utility Knife	1	each
• Pry, Bar 12 inch	1	each
• Flex Funnel	1	each
• Roll electrical I tape	1	each
• Roll tie wire 20in	1	each
Boom Extra Accessories & Camlock Fittings Tote	**1**	**tote**
• Shackles, 3/8"	6	each
• Shackles, 1/2"	6	each
• Shackles, 5/8"	6	each
• Caribiners	25	each
• Rebar caps	25	each
• Camlock adapters 3" Female to 2" Male	1	each
• Camlock adapters 3" Male to 2" Female	1	each
Elastec Skimmer Totes	**2**	**tote**
Action Packer Tote 1 of 2		
• Skimmer Hydraulic Hoses	2	each
• Hose Floats	2	each
• Sorbent Pads	4	each
• Tool Kit	1	each
• Clear Bag	1	Each
Action Packer Tote 2 of 2		
• Pump Hydraulics Hoses	2	each
• 2" Centrifugal Pump	1	each
• Skimmer Spare Parts	2	each

TABLE 3-15 (CONTINUED) 26' SUMMER TRAILER

Description	Quantity	Unit
• Spare Scraper Blades	2	each
• Pump Seal	1	each
• Operating Manual	1	each
• Sorbent Pads	4	each
• Clean Rags	4	each

TABLE 3-16 26' WINTER TRAILER

Description	Quantity	Unit
Skimmer, Oleophilic, Rope Mop, Power Head, Electric, with sump	1	each
Ice Profiling drill	1	each
Chains, Tire, for Trailers Rears Axle	1	set
Wheel Chocks	2	pair
Chain Saw, Stihl, with 36" Bar	2	each
Drill, Ice, Power Auger, 8", Gas, 2 Cycle	2	each
Pump, Diaphragm, 2", Diesel, Yanmar, 140lbs	1	each
4' Step Ladder	1	each
Hose, Suction/ Discharge, 2in x 18ft, Caps & Plugs 12 sections	216	ft
Sorbent, Pads, Bale of 100	4	each
Visqueen, Reinforced, 10mil, 20' x 100' Roll	1	each
Sorbent Boom in Clear Bags, 10'L (8 sections)	80	ft
Spare Tire	1	each
Heater, 35,000 BTU, indirector fired, portable, Hunter mfg	1	each
Dolly, two wheel w/fold down nose	1	each
Skimmer, Oleophilic, Rope, Mop, System	1	each
Tent, Arctic Oven 10 X 20	1	each
Trailer Steps (removable)	1	each
Containments, f/power packs	2	each
Bags, oil waste	2	box
Sorbent, Rolls, 38" x 144"	1	each
Ice Trenching Sled, Stihl Magnum 880, 41" bar	1	each
Generator, 2KW, Honda, Gas, EU2000i	1	each
Generator, 2KW, Honda, Gas, EU2000i	1	each
Tank, Fast Tank, 1200 Gallon	4	each
Parallel Kit, Honda Generator	1	each
Skimmer, Rope Mop (2")	1	each
Fire Extinguisher	1	each
Kit, Ice	**1**	**kit**
• Storage Container, 24-gallon	1	each
• Chaps for Chain Saw	2	pair
• Ice Sandals with Metal Screws	3	pair
• Drip Pan, 24" x 24" for 18" Absorbent Pads	1	each
• Rubber Gloves, Insulated, Hi-Viz, Orange	10	pair
• Goggles, Snow Machine	2	each
• Faceshield Steel Screen, Mesh	1	each
• First Aid Kit, Small, 10 Unit, 2-person	1	each
• Rain Jackets	2	each
• Rain Pants/Bibs	2	each
• Storage Container, 24-gallon	1	each
• Socket Set with Ratchet, 3/8" or 1/2"	1	each
• Chain, Spare for Chain Saw	2	each

TABLE 3-16 (CONTINUED) 26' WINTER TRAILER

Description	Quantity	Unit
• Bar, Spare for Chain Saw	1	each
• Replacement Blades for 8" Gas Ice Auger	4	each
• Replacement Blades for Hand Auger	2	each
• Spark Plugs for Ice Augers	4	each
• Spark Plugs for Chain Saw	2	each
• Tie Wire	1	roll
• Ear Plugs (12 minimum)	1	box
• Safety Harnesses, Full Body	2	each
• PFD's (May be located in trailer or conex in other kits inventory)	2	each
• Extensions for Power Auger	4	each
• 50-ft. Rope Bags with carabiners attached at both ends, approx ½" Rope	4	each
• Yellow Barricade Flagging, CAUTION	1	roll
• Aluminum Pipe Wrench, approx 18" - 36"	1	each
• 2 oz Two cycle oil	6	each
• chalk line	1	each
• Ice Lift Bar	1	each
• Phillips, #1, 6"	1	each
• Phillips, #2, 6"	1	each
• Flat, 10"	1	each
• Flat, 8"	1	each
• Flat, 6"	1	each
• Flat, 10"	1	each
• Toolbox, Red Plastic, 19"	1	each
• Pliers, Needle Nose, Side Cutters, 8"	1	each
• Adjustable Wrench, 8"	1	each
• Adjustable Wrench, 10"	2	each
• Measuring Tape, Fiberglass, 100-ft.	1	each
• Cutters, Wire, Diagonal, 7"	1	each
• Chain Saw File, 7/32"	2	each
• File, Flat, Mill Bastard, 10"	1	each
• File, Flat, Mill Cut, 6"	1	each
• Pliers, Lineman, Flat Nose, 8"	1	each
• Pliers, Locking, Straight Jaws, 8" (Vise Grips)	1	each
• Chain Saw Wrench, Plug Removal/Chain Adjustment	1	each
• Spark Plug Wrench for Ice Auger	1	each
• Claw Hammer	1	each
• Ice Augers, 8" dia, 36"L	2	each
• Ice Auger, Manual, with 6" Extension	1	each
• Ice Tongs, Large, 16" Tool Barrel in trailers	2	each
• Scoop Shovels, with drilled holes approx 1" in Tool Barrel	2	each
• Ice Scrapers in Tool Barrel	2	each
• Pry Bars, 5-ft. minimum in Tool Barrel	2	each

TABLE 3-16 (CONTINUED) 26' WINTER TRAILER

Description	Quantity	Unit
Kit, Fuel Cans	**1**	**kit**
• 5 gallon jerry cans for hunter heater #! diesel (full)	2	each
• DOT approved 5 gallon Saftey can 1# diesel can (full)	1	each
• Fuel, gas premix, 50:1 (32oz) 92 octane bottle	12	each
• DOT approved, 1 gallon can empty	1	each
Kit, Decon, 85 Gal Salvage Drum	**1**	**kit**
• Barricade, Easel W/O Barricade Light	1	each
• Dry Erase Board, approximately 24" x 18" w/Markers and Eraser	1	each
• PVC Ground Cloth/Liner, approximately 6-ft. x 18-ft. Ortla Liner	1	each
• Wash Brushes, Long Handle	2	each
• Containment, flexible portable 24"X24" minimum	1	each
• Protective Hand Lotion, minimum of 8-oz size	1	bottle
• Water Cooler, 5-gallon	1	each
• Bottle of 409 Spray Bottle	1	each
• Insect Repellent	2	each
• Flashlights, D-Cell Type	4	each
• D-Cell Batteries for Flashlights	16	each
• pH Meter Paper w/Charts	1	pack
• Paper Towels	2	rolls
• Duct Tape, 2" or 3"	5	rolls
• First Aid Kit, 16 Unit	1	each
• Fire Extinguisher, 10# Dry Chemical	1	each
• Flagging Tape, Orange	2	rolls
• Round Point Shovels (found in Tool Barrel)	2	each
• Sorbent Pads, 50 count	1	each
• Clear Bags, 35-gallon minimum	25	each
• Goggles, Antifog, Splashproof	4	each
• Eye Rinse Solution, minimum of 16-oz. for each bottle	2	bottles
• Safety Glasses	4	each
• Ear Plugs	1	box
• Disposable Respirator, size LG, 3M	1	each
• Disposable Respirators, size MED, 3M	3	each
• Polar Gloves, Winter Foam Lined	4	pair
• Nitrile Gloves	1	box
• Neoprene Gloves	4	pair
• Green Ape Gloves, Cotton	4	pair
• PVC Disposable Gloves, Powdered, 6.5 Mil, size LG	1	box
• Rain Pants, Bib, Yellow, size XL	4	each
• Rain Jackets, Yellow Hood w/ Buttons, size XL	4	each
• Disposable Tyvek Coveralls, Yellow	4	each
• Latex Overboot Covers, size XL	4	each
• Folding Chair	1	each

TABLE 3-16 (CONTINUED) 26' WINTER TRAILER

Description	Quantity	Unit
Kit, Helicopter Sling	**1**	**kit**
• Safety Goggles	2	each
• Ear Plugs	12	pair
• Boat Crew Helmet	2	each
• Lineman OR Rubber Insulated Gloves	2	pair
• 10-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
• 20-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
• Cargo Nets, approx 20-ft. x 20-ft.	2	each
• 3/4 inch shackles	2	each
Kit, Rope Mop	**1**	**kit**
• Down hole attachment (not need for sump rope mops)	1	each
• Float pulley (Only 1 required in rope mops with barrel sumps)	2	each
• Rope Mop 100' (minimum length)	2	each
• 2" X 50' discharge hose	2	each
• Sledge hammer	1	each
• 2" ball valve assembly	1	each
• Steel stakes 6 each	6	each
• Barrel with lid and clamp (sump rope mops not needed)	1	each
• Drip pan	1	each
• Rope throw bag 100'	3	each
• Rope throw bag 50'	2	each
• Rebar caps	6	each

TABLE 3-17 45' TRAILER

Description	Quantity	Unit
Pump, IMP65F Vikoma Transfer Pump, f/Duplex skimmer	1	each
Powerpack, Aqua Guard Skimmer, Diesel/Hydraulic, Yanmar, 2108	1	each
Boom, Fastwater, 6" x 4" x 33'	528	ft
Hip Boots, Assorted	20	pair
Knee Boots, Assorted sizes	20	pair
Visqueen, Reinforced, 20' x 100' Roll, 49lbs	3	each
Generator, Diesel, 3KW, Yanmar, L60, 60HZ, Volt: 120/240 AC	1	each
Pump, Peristaltic, 2", Diesel	1	each
Tent, Arctic Oven 10 X 20	1	each
Metal Gas Can, 5-gallon, Diesel (Full) with Pour Spout	4	each
Tank, Canflex, 2000 Gallon, 160lbs	2	each
Skimmer, Oleophilic, Aqua Guard, W/Brush Module & Comb Attachment	1	each
Boom, Sorbent	80	ft
Chain Saw, Stihl, with 36" Bar, 066	1	each
Boom, Containment, 8" x 8" x 33'L	66	ft
Pump, Diaphragm, Aqua Guard Skimmer, 2" Diesel, Yanmar, L40AE-DB	1	each
Winch, Portable, Gas, Capstan, Stihl	1	each
skimmer, duplex, vikoma	1	each
Power Pack, hydraulic, GP7, Vikoma	1	each
Weight Scale, 5000Lbs Rated, "Dynamometer"	1	each
Skimmer, Manta Ray, 4', w/4" to 3" Reducer Camlock	1	each
Skimmer, Weir, MiniMax, Desmi	1	each
Chain Saw, Stihl, with 20" Bar, 026	1	each
Chain Saw, Stihl, with 20" Bar, 026	1	each
Chain Saw, Stihl, with 36" Bar	1	each
Drill, Ice, Power Auger, 8", Gas, 2 Cycle	1	each
Drill, Ice, Power Auger, 8", Gas, 2 Cycle	1	each
Dam, Portable, Megasecur 28"	1	each
Pump, Centrifugal, 2", Diesel, Trash, Yanmar, 175 GPM, .199L,	1	each
Motor, Outboard, Short Shaft, 5.0 H.P., Honda	1	each
Sorbent, Pads, Bale of 100	3	each
Hose, Discharge, Lay Flat, 3in x 50ft, Camlock Male-Female, 4ea	200	ft
Hose, Discharge, Lay Flat, 2in x 50ft, Camlock Male-Female, 4ea	200	ft
Hose, Suction Discharge, 2in x 20ft, Camlock Male-Female, -65F, 16ea	320	ft
Hose, Suction Discharge, 3in x 20ft, Camlock Male-Female, -65F, 6ea	120	ft
Misc Materials, Rags, Cotton, 50lb Box	1	box
Come-A-Long, Rope, 1/2"	4	each
Flashlight, Lantern, W/6 Volt Batteries	10	unit
Misc Materials, Water Cooler, Igloo, 5 Gallon	2	each
Misc Materials, Ice Chest, Igloo, 50 Quart	2	each
Misc Materials, Survey Tape, Orange, 1-3/16" x 300Ft	10	each
Misc Materials, Duct Tape, 2" x 60yards	10	roll

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
Misc Materials, Extension Cord, All Weather, 50Ft, -50 F	2	each
Cable Cutter, Hammer Type, Size 1 1/6" Wire Rope	1	each
Sand Bags (Empty), 300 each per Action Packer	2	each
Bags, Clear Plastic, 38" x 65", 55 Gal	4	box
PVC Pipe, 3in x 20Ft, Sch 40, f/Underflow Dam, 16ea	320	ft
PVC Pipe, 4in x 20Ft, Sch 40, f/Underflow Dam, 6ea	120	ft
Personal Flotation Devices, Assorted	12	each
Safety Equipment, Orange Safety Traffic Cones, 18"	10	each
Marker Buoy, A-1W, PolyForm	3	each
Safety Vest, Polymesh, Orange w/ Silver Stripe, Size XL	6	each
Shore Power Cord, 45Ft OSCP Trailer	1	each
Sorbent, Rolls, 38" x 144"	2	each
Sorbent, Rolls, 38" x 144"	1	each
Tool Cart, Rollaway, 5 Drawer, Rubbermaid	1	each
Weed Burner, Propane, All Purpose, Red Dragon, Hose w/Regulator	1	each
PPE, Knee Pads w/Velcro	2	pair
PPE, Dust Mask, Particle, 3M	1	box
PPE, Ear Plugs, Orange, 200/Box	1	box
Safety Goggles, Vented, Splash Proof	6	each
Safety Glasses, Clear, Genesis, Uvex	10	each
Gloves, Rubber, Insulated, Hi Viz	12	pair
Gloves, Rubber, Non-Insulated, 10" Cuff	12	pair
Gloves, Nitrile, Disposable, Inspection/Examine	1	box
Gloves, Cotton, "Green Ape"	12	pair
Boots, Overshoe, Disposable, XL, Latex Rubber, 12"L	100	pair
Misc Materials, Bucket, Galvanized Steel/Plastic, 5 Gallon	5	each
Nails, 16 Penny, Duplex, 5lbs	5	lb
Drinking Water, 24 bottles/case	2	case
Flashlight, Headlamp, pelican 2610	20	each
Misc Materials, Barricade Tape, "Caution Do Not Enter", 300Ft	1	each
Ice Sandals w/Metal Screws	10	pair
Dual Cartridge Respirators, Disposable, 3M, Assorted Sizes	42	each
Gloves, Leather, Foam Lined, Refrigiwear	12	pair
Boom Anchor Plates, Aluminum w/ shackles	3	each
Portapotty, Nutter special	2	each
Metal Fuel Cans, 5-gallon (Full)	4	each
Tow Bridles, Fastwater Boom	2	each
Rain Gear	38	set
Tyvek Suits, Coveralls, Disposable	120	each
Batteries, AA, for flashlight head lamps	32	each
Outboard, Prop, 20 HP, 4 Stroke, Tohastu	1	each
Boat Helmet, Ventilated, Petzl	12	each

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
Kit A, Vikoma Duplex Skimmer	**1**	**kit**
• Brush Comb Scraper	2	each
• Sorbent Pads	10	each
• Cotton Rags	10	each
• 1/2 inch hydraulic hose pressure and return w/male & female quick disconnect fittings	1	pair
• Clear Bags	2	each
• Equipment manuals for Komara Duplex Skimmer, GP-7, IMP65F Transfer pump	1	each
• Camlock Reducer	1	each
• Small Tool Kit Pouch	1	each
• 8 inch crescent wrench	1	each
• Allen wrenches metric 10mm-1.5mm	1	set
• Open to open wrench 12mm - 10mm	1	each
• Open to open wrench 14mm - 17mm	1	each
• Open to box wrench 13mm	1	each
• T handle wrench 6 inches long	1	each
• Phillips screw driver	1	each
• Squeeze bottle for priming yanmar engine	1	each
Kit B, Vikoma Duplex Skimmer	**1**	**kit**
• 3/8 inch X 40 feet hydraulic hose pressure and return w/male & female quick disconnect fittings 330 BAR Duplex skimmer to power pack	1	pair
• 3/8 inch X 3 feet hydraulic hose pressure and return w/male & female quick disconnect fittings 330 BAR for IMP65F Floating Transfer Pump to duplex skimmer	1	pair
• Hose floats	3	each
Kit, Helicopter Sling	**1**	**kit**
• Safety Goggles	2	each
• Ear Plugs	12	pair
• Boat Crew Helmet	2	each
• Lineman OR Rubber Insulated Gloves	2	pair
• 10-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
• 20-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
• Cargo Nets, approx 20-ft. x 20-ft.	2	each
• 3/4 inch shackles	2	each
Skimmer, Aqua Guard, Hydraulic, W/Suction Discharge Hose Bag, System	**1**	**kit**
• Hose Bag	1	each
• Hydraulic Hose, 50-ft. with Quick Disconnect Couplings	1	each
• Suction Hose, 2" x 20-ft., with Camlok Fittings	1	each
• Discharge Hose, 2" x 50-ft., with Camlok Fittings	1	each
• Spare Diaphragms for 2" Pump	2	each
• Flap Check Valves for 2" Pump	2	each
• Hose Float	1	each
• Scraper Blade or Disc Attachment	1	each
• Brush, Drum, or Disc Module with Scrapers	1	each
• Aluminum Carrying Poles	2	each

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
Kit, Barricade	**1**	**kit**
• Caution Signs: "Containment Area"	3	each
• Caution Signs: "Incident Area"	3	each
• Cautions Signs: "Staging Area"	3	each
• Caution Signs: "Danger, Benzene", "Cancer Hazard", "Flammable, No Smoking", "Authorized Personnel Only", and "Respirator Required"	4	each
• Caution Signs: "No Smoking in This Area"	4	each
• Barricade Light w/Batteries	10	each
• Rolls of Surveyors Flagging Tape, Flourescent Orange	20	each
• Roll of 18-gauge Tie Wire	1	each
• Barricade Light Wrench (Socket)	1	each
• Traffic Barricades	10	each
• Barricade Tape, Yelllow & Black, 2" x 150-ft.	1	each
Kit, Boom Accessories	**2**	**kit**
• Storage Container	1	each
• Rope Bags, 1/2" Diameter, 50'L minimum for each bag	10	each
• Steel Stakes, Approx. 1" x 3-ft.	10	each
• Boom Anchor Bridles	10	each
• Tow Bridles, Fastwater Boom	2	each
• Spare Boom Connector Pins	4	each
• Duckbill Anchors	10	each
• Carabiners, D Aluminum 3/8" x 4"L, 4400# or greater	15	each
• Ascenders, Petzel, Ascension	10	each
• Pulleys, Climbing/Pulling, Rope, 4.5" x 2.5", for 16mm rope	5	each
• Duckbill Driver, 3/4" size stored outside of Boom Accessory Kit box	1	each
• Sledge Hammer 8-lb. stored outside of Boom Accessory Kit box	2	each
• Rebar caps	10	each
• 1/2 inch Clevis (shackle)	6	each
Kit, Brush	**2**	**kit**
• 24in Pruning Shears	1	each
• 24in Bow Saw	1	each
• 1 gallon Bar and Chain Lubricant	1	each
• 1 gallon Metal Gas Can	1	each
• Chainsaw Kit	1	each
• Case of 6 Bottles of 2-cycle Oil	1	each
• Spark Plug Wrench	2	each
• Spare Chain for Chain Saw	2	each
• Chain Saw File Set	1	each
• Spark Plugs for Chainsaw	2	each
• Hard Hat w/Face Shield	1	each
• Chainsaw Chaps	1	pair
• Leather Gloves	2	pairs

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
• Allen Wrench	1	each
• Screwdriver	1	each
• Safety Glasses	2	each
• extra 20" chainsaw bar	1	each
Kit, Gun, Line Throwing	**1**	**kit**
• GUN, BRIDGER 0.45 CALIBER, MODEL 85	1	each
• 950FT. SPOOL, LINE GUN CORD, 70# TEST	1	each
• 600FT. SPOOL, LINE GUN CORD, 140# TEST	3	each
• CLEANING KIT	1	each
• PROJECTILES	11	each
• SPOOL SPINDLES	3	each
• HEAVY LOAD CARTRIDGES 2005 kept with Security at the Guard shack	50	each
• MEDIUM LOAD CARTRIDGES 2005 kept with Security at the Guard shack	20	each
• LIGHT LOAD CARTRIDGES 2005 kept with Security at the Guard shack	20	each
Extra Parts	**1**	**kit**
• Boom Spring Pins, Toggle	5	each
• Ratchet Straps, 1" x 16' , w/Hooks, 3000#	9	each
• Rachet Straps, 1" X 5' , w/Hooks	6	each
• Camlocks 3"F X 2" M	2	each
• Camlocks 2"F X 2" M	2	each
• Camlocks 4"F X 3" M	1	each
• Camlocks 3"FX 2" F pipe	1	each
• Camlocks 2 F X 2" F pipe	1	each
• Camlocks 2" Cap	1	each
• Camlocks 2" Plug	1	each
Kit, Decon, 85 Gal Salvage Drum	**1**	**kit**
• Barricade, Easel W/O Barricade Light	1	each
• Dry Erase Board, approximately 24" x 18" w/Markers and Eraser	1	each
• PVC Ground Cloth/Liner, approximately 6-ft. x 18-ft. Ortla Liner	1	each
• Wash Brushes, Long Handle	2	each
• Containment, flexible portable 24"X24" minimum	1	each
• Protective Hand Lotion, minimum of 8-oz size	1	bottle
• Water Cooler, 5-gallon	1	each
• Bottle of 409 Spray Bottle	1	each
• Insect Repellent	2	each
• Flashlights, D-Cell Type	4	each
• D-Cell Batteries for Flashlights	16	each
• pH Meter Paper w/Charts	1	pack
• Paper Towels	2	rolls
• Duct Tape, 2" or 3"	5	rolls
• First Aid Kit, 16 Unit	1	each
• Fire Extinguisher, 10# Dry Chemical	1	each

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
• Flagging Tape, Orange	2	rolls
• Round Point Shovels (found in Tool Barrel)	2	each
• Sorbent Pads, 50 count	1	each
• Clear Bags, 35-gallon minimum	25	each
• Goggles, Antifog, Splashproof	4	each
• Eye Rinse Solution, minimum of 16-oz. for each bottle	2	bottles
• Safety Glasses	4	each
• Ear Plugs	1	box
• Disposable Respirator, size LG, 3M	1	each
• Disposable Respirators, size MED, 3M	3	each
• Polar Gloves, Winter Foam Lined	4	pair
• Nitrile Gloves	1	box
• Neoprene Gloves	4	pair
• Green Ape Gloves, Cotton	4	pair
• PVC Disposable Gloves, Powdered, 6.5 Mil, size LG	1	box
• Rain Pants, Bib, Yellow, size XL	4	each
• Rain Jackets, Yellow Hood w/ Buttons, size XL	4	each
• Disposable Tyvek Coveralls, Yellow	4	each
• Latex Overboot Covers, size XL	4	each
• Folding Chair	1	each
Kit, Ice	**1**	**kit**
• Storage Container, 24-gallon	1	each
• Chaps for Chain Saw	2	pair
• Ice Sandals with Metal Screws	3	pair
• Drip Pan, 24" x 24" for 18" Absorbent Pads	1	each
• Rubber Gloves, Insulated, Hi-Viz, Orange	10	pair
• Goggles, Snow Machine	2	each
• Faceshield Steel Screen, Mesh	1	each
• First Aid Kit, Small, 10 Unit, 2-person	1	each
• Rain Jackets	2	each
• Rain Pants/Bibs	2	each
• Storage Container, 24-gallon	1	each
• Socket Set with Ratchet, 3/8" or 1/2"	1	each
• Chain, Spare for Chain Saw	2	each
• Bar, Spare for Chain Saw	1	each
• Replacement Blades for 8" Gas Ice Auger	4	each
• Replacement Blades for Hand Auger	2	each
• Spark Plugs for Ice Augers	4	each
• Spark Plugs for Chain Saw	2	each
• Tie Wire	1	roll
• Ear Plugs (12 minimum)	1	box
• Safety Harnesses, Full Body	2	each

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
• PFD's (May be located in trailer or conex in other kits inventory)	2	each
• Extensions for Power Auger	4	each
• 50-ft. Rope Bags with carabiners attached at both ends, approx ½" Rope	4	each
• Yellow Barricade Flagging, CAUTION	1	roll
• Aluminum Pipe Wrench, approx 18" - 36"	1	each
• 2 oz Two cycle oil	6	each
• chalk line	1	each
• Ice Lift Bar	1	each
• Phillips, #1, 6"	1	each
• Phillips, #2, 6"	1	each
• Flat, 10"	1	each
• Flat, 8"	1	each
• Flat, 6"	1	each
• Flat, 10"	1	each
• Toolbox, Red Plastic, 19"	1	each
• Pliers, Needle Nose, Side Cutters, 8"	1	each
• Adjustable Wrench, 8"	1	each
• Adjustable Wrench, 10"	2	each
• Measuring Tape, Fiberglass, 100-ft.	1	each
• Cutters, Wire, Diagonal, 7"	1	each
• Chain Saw File, 7/32"	2	each
• File, Flat, Mill Bastard, 10"	1	each
• File, Flat, Mill Cut, 6"	1	each
• Pliers, Lineman, Flat Nose, 8"	1	each
• Pliers, Locking, Straight Jaws, 8" (Vise Grips)	1	each
• Chain Saw Wrench, Plug Removal/Chain Adjustment	1	each
• Spark Plug Wrench for Ice Auger	1	each
• Claw Hammer	1	each
• Ice Augers, 8" dia, 36"L	2	each
• Ice Auger, Manual, with 6" Extension	1	each
• Ice Tongs, Large, 16" Tool Barrel in trailers	2	each
• Scoop Shovels, with drilled holes approx 1" in Tool Barrel	2	each
• Ice Scrapers in Tool Barrel	2	each
• Pry Bars, 5-ft. minimum in Tool Barrel	2	each
Kit, Culvert Pipe Plugs 24" & 36"	**1**	**kit**
• Bottles of Nitrogen 39 Cu FT	2	each
• Small storage cart for securing nitrogen bottles	1	each
• 24" Culvert plug	1	each
• 36" Culvet plug	1	each
Kit, Landing Zone	**1**	**kit**
• Storage Container, 24-Gallon (empty)	2	each
• Windsock Frame with Stand, 9 Foot Pole	1	each

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
• Windsock, 18" x 5-ft, Orange	2	each
Fasteners and Slings	**1**	**kit**
• 3/8 inch Clevis (shackle)	12	each
• 7/16 inch Clevis (shackle)	2	each
• ¾ inch Clevis (shackle)	6	each
• ½ inch Clevis (shackle)	6	each
• Fish Tote Lid Tool	2	each
• Slings assorted sizes:		
– 2inx 16ft Nylon sling-Vertical 6400 LBS	2	each
– 1in x 4ft Nylon sling-Vertical 3200 LBS	4	each
– 2in x 8ft Nylon sling-Vertical 1600 LBS	2	each
Duplex skimmer spare parts kit	**1**	**kit**
• O ring	1	each
• PE Foam	1	sheet
• filter, suction	2	each
• Element, ari breather	1	each
• elemant return	1	each
• seal, kit, returm filter	1	each
• belt, drive	1	each
• spare parts kit, engine, yanmar	1	each
Kit, Boat, inflatable, Achilles, 12.5 foot, SGX	**1**	**kit**
• Inflatable boat	1	each
• Boat Anchor, with 50Ft. Anchor Line, 15#	1	each
• Boat Pump	1	each
• PFDs	2	each
• Oars	2	each
• Boards for Raft Floor	1	set
• Boat Patch Kit	1	each
• Bag to Carry Boat	1	each
• 2 1/2 gallon Tohastu outboard fuel can w/ fuel hose.	1	each
• 5 gallon fuel can for Tohastu outboard	1	each
• 5 gallon fuel can for Honda 5 hp outboard w/ fuel hose (not required at PS02 & PS10)	1	each
Hand Tools, Assorted	**1**	**kit**
• Rake, Metal, Long Handle	5	each
• Hoe, Long Handle	1	each
• Pry Bar, 5ft	4	each
• Mattocks Pick	5	each
• Shovel, #2 Round Point, Long Handle	5	each
• Shovel, Square Point, D-Handle	3	each
• Shovel, Drain Spade, Sharpshooter	2	each
• Shovel, Scoop, Aluminum, D-Handle	1	each
• Shovel, #2 Square Point, Long Handle	2	each

TABLE 3-17 (CONTINUED) 45' TRAILER

Description	Quantity	Unit
• Shovel, Round Point, D-Handle	5	each
• Ice Scraper	2	each
• Sledge Hammer, 8lb	5	each
• Shovel, Aluminum, Scoop w/ 1" Diameter Drilled Holes	2	each
• Stakes, Anchor	25	each

TABLE 3-18 SERVS EQUIPMENT INVENTORY

Equipment Description	Quantity	Equipment Description	Quantity
River Operations Trailer			
Skimmer, Mini-Max	1	Sheeting, Plastic, 10 mil	Roll
Skimmer, Mini-Fast Flow	1	Rope, 1/2" × 20'	14
Pump, Peristaltic, 2" Diesel	1	Rope, 5/8" × 20'	7
Pump, Diaphragm, 3" Diesel	1	Rope, 1/2" × 600', nylon	1
Hose, Discharge, 2" × 50'	1	Rope, 1/2" × 600', poly	1
Hose, Discharge, 3" × 50'	2	Sorbents, Roll, 36" × 150'	1
Hose, Suction, 2" × 25'	1	Sorbents, Pad, 17" × 19" – 100 each	3
Anchor, Danforth 9 lb.	3	Sorbents, Boom, 4" × 10'	3
Anchor, Collapsible 10 lb.	4	Sorbents, Boom, 8" × 10'	2
Anchor, Duckbill	20	Sorbents, Sweep, 19" × 100'	1
Buoy, Inflatable	4	Boots, Wader, assorted sizes	15
Generator, 6 kw	1	Boots, Knee-high, assorted sizes	15
Shovels	8	Coveralls, assorted sizes	60
Rakes	2	Gloves, Rubber, pr.	10
Garbage Bags, 4 mil	7		

TABLE 3-18 (CONTINUED) SERVS EQUIPMENT INVENTORY

Equipment Description	Quantity	Equipment Description	Quantity
Land Spill Trailer Inventory			
Ice Auger	1	Hose, Suction, 2" × 25'	4
Chain Saw, 16" Bar	1	Hose, Suction, 3" × 25'	4
Generator, 5 kw	1	Salvage Drum/Overpack, 85 gallon	1
Generator, 6 kw	1	Storage Drum, 55 gallon	1
Culvert Block, Plywood, 12"	4	Sand Bags, empty, 14" × 26'	400
Culvert Block, Plywood, 16"	2	Protective Equipment – Boots, assorted sizes, pair	15
Culvert Block, Plywood, 24"	2	Protective Equipment – Coveralls, assorted sizes, each	75
Culvert Block, Plywood, 30"	4	Sorbents, Roll, 150'	1
Culvert Block, Plywood, 48"	2	Sorbents, Boom, 4" × 10'	3
Skimmer, Aqua Guard RBS-5, Drum/ Brush	1	Sorbents, Pads, 17" × 19', 100 each	1
Skimmer Power Pack/Aqua Guard	1	Garbage Bags, 4 mil, 100 per case	7
Skimmer Pump, 2", Aqua Guard	1	Plastic Sheeting, 20' × 100', 10 mil	1
Pump, Centrifugal, 2"	1	Pipe, Plastic, 12"	20 ft
Pump, Centrifugal, 3"	1	Pipe, Plastic, 10"	30 ft.
Hose, Discharge, 3" × 25'	2	Pipe, Plastic, 8"	10 ft.
Hose, Discharge, 3" × 50'	1	Pipe, Plastic, 6"	20 ft.

TABLE 3-19 CONTAINMENT SITES – EQUIPMENT

Pump Station	CS #	Location	Standard Conex (187)	Enhanced Standard Conex (188)	Auxiliary Conex (189)	Additional Inventory Items
(b) (7)(F), (b) (3)	CS 1-1A	(b) (7)(F), (b) (3)	04-187-001		04-189-062	
	CS 2-0		04-187-002		04-189-047	
	CS 2-1				04-189-050 04-189-051	
	CS 2-2					X
	CS 2-3					X
	CS 2-4A				04-189-052	
	CS 2-5		04-187-003		04-189-061	
	CS 2-8					X
	CS 3-3					X
	CS 3-3A				04-189-053	
	CS 3-4				04-189-054	
	CS 3-9				04-189-055	
	CS 3-11					X
	CS 3-12					X
	CS 3-15		04-187-004			
	CS 3-15A					X
	CS 3-19		04-187-005			
	CS 3-22				04-189-058 (at CS 3-29)	
	CS 3-23		04-187-006			
	CS 3-26					X

TABLE 3-19 (CONTINUED) CONTAINMENT SITES – EQUIPMENT

Pump Station	CS #	Location	Standard Conex (187)	Enhanced Standard Conex (188)	Auxiliary Conex (189)	Additional Inventory Items
(b) (7)(F), (b) (3)	CS 3-29	(b) (7)(F), (b) (3)	04-187-007		04-189-058 (for CS 3-22)	
	CS 3-31					X
	CS 3-32			04-188-044		
	CS 4-2		04-187-008			
	CS 4-7			04-188-045		
	CS 4-10		04-187-009			
	CS 4-16A		04-187-010			
	CS 4-17		04-187-011			
	CS 4-20		04-187-012			
	CS 4-21		04-187-013			
	CS 4-26		04-187-014			
	CS 4-29					X
	CS 5-10		04-187-015	Note: This conex services CS 5-9 and CS 5-10.		
	CS 5-24					X
	CS 5-29					X
	CS 6-2			Note: Equipment is stored at YRB.		X
	CS 6-4			04-188-038	04-189-039	X
	CS 6-6					X
	CS 6-11A		04-187-016		04-189-040	X

TABLE 3-19 (CONTINUED) CONTAINMENT SITES – EQUIPMENT

Pump Station	CS #	Location	Standard Conex (187)	Enhanced Standard Conex (188)	Auxiliary Conex (189)	Additional Inventory Items
(b) (7)(F), (b) (3)	CS 6-11B	(b) (7)(F), (b) (3)	04-187-017		04-189-041 04-189-042	
	CS 6-11C		04-187-018			
	CS 6-11D			04-188-043		
	CS 6-13				04-189-045 04-189-046	X
	CS 6-16					X
	CS 6-23					X
	CS 6-24			04-188-047	04-189-048	X
	CS 6-25					X
			04-187-019			
	CS 6-26			04-188-046		
	CS 6-34			Note: Equipment is stored at RGV 65.	04-189-065	
	CS 6-35					X
	CS 6-37					X
	CS 6-38					X
	CS 7-3					X
	CS 7-4					X
	CS 7-5					X
	CS 7-6					X
	CS 7-9					X
	CS 7-10					X

TABLE 3-19 (CONTINUED) CONTAINMENT SITES – EQUIPMENT

Pump Station	CS #	Location	Standard Conex (187)	Enhanced Standard Conex (188)	Auxiliary Conex (189)	Additional Inventory Items
(b) (7)(F), (b) (3)	CS 7-18	(b) (7)(F), (b) (3)				X
	CS 7-33A				04-189-064	
	CS 8-2			04-188-049		X
	CS 8-4					X
	CS 8-6A		04-187-020			
	CS 8-7					X
	CS 8-8					X
	CS 8-12			04-188-036		
	CS 8-14				04-189-063	
	CS 8-16			04-188-037	04-189-059	
	CS 10-4					X
	CS 10-5					X
	CS 10-17		04-187-023			
	CS 11-2A			04-188-024	04-189-025	
	CS 11-3			04-188-026	04-189-027	
	CS 11-6			04-188-028	04-189-029	X
	CS 11-7			04-188-030	04-189-031	
	CS 12-3			04-188-032	04-189-033	

TABLE 3-19 (CONTINUED) CONTAINMENT SITES – EQUIPMENT

Pump Station	CS #	Location	Standard Conex (187)	Enhanced Standard Conex (188)	Auxiliary Conex (189)	Additional Inventory Items
(b) (7)(F), (b) (3)	CS 12-3A	(b) (7)(F), (b) (3)		04-188-034	Note: Conex is stored at 8-APL-1 in winter out of avalanche zone.	
	CS 12-3C		04-187-021			
	CS 12-4			04-188-035		X
				04-186-040	04-189-026	
				04-186-041	04-189-028	

Containment Site Naming Convention Abbreviations

Oks Creek	Oksrukuyik Creek
Put River	Putuligayuk River
Sag River	Sagavanirktok River

TABLE 3-20 STANDARD CONEX INVENTORY (187)

Description	Quantity	Unit
TOOL BOX INVENTORY:		
Tool Box	1	each
Pry Bars, Steel, "Wonder Bar", 1-3/4"W, 12-3/8"L	2	each
Channel Lock Pliers	1	each
3/8" Socket Set w/Ratchet	1	each
Claw Hammer	1	each
Needle Nose Pliers	1	each
Side Cutter / Lineman Pliers	1	each
10" Crescent Wrench	2	each
Vise Grip	1	each
Tie Wire	1	roll
2" Hose Gaskets	2	each
3" Hose Gaskets	2	each
Screwdriver Combo Set, Phillips/Straight Tip:		
Phillips, #1, 6"	1	each
Phillips, #2, 6"	1	each
Flat, 10"	1	each
Flat, 8"	1	each
Flat, 6"	1	each
Flat, 10"	1	each
CONEX ACCESSORIES:		
Rebar caps	25	each
Discharge Hose, 3" x 50-ft. with Caps & Plugs	200	feet
Suction Hose 3" x 18-ft. with Caps & Plugs	90	feet
Discharge Hose, 2" x 50-ft.	150	feet
3" Hose Floats	20	each
Carabiners (minimum)	30	each
Ascenders (minimum)	10	each
Pulleys (minimum)	5	each
Rope Pulley Come-Along	2	each
Duct Tape	1	roll
Round Point Shovel	2	each
Square Point Shovel (5-ft. or 4-ft.)	2	each
Pitch Forks	2	each
Mattocks Picks	2	each
8-lb. Sledge Hammers	2	each
Rakes	2	each
60" Wrecking Bars	2	each
Single Blade Axe	2	each
Fence Post Driver	1	each
Steel Stakes (approximately 1"dia. x 30")	10	each
Hand Saw	1	each

TABLE 3-20 (CONTINUED) STANDARD CONEX INVENTORY (187)

Description	Quantity	Unit
Steel Posts	10	each
Duckbill Driver	1	each
One duckbill anchor per boom section in conex. *(This includes fast water and containment boom sections.)*	1	each
Large Respirators	2	each
Medium Respirators	2	each
Rain suits (assorted sizes: M, L, XL)	4	each
Tyvek Suits	4	each
Hip Boots	2	pair
Rubber Gloves	4	pair
First Aid Kit *(Visually inspect inventory contents.)*	1	each
½" Poly Line, 300-ft. minimum (600-ft. spool)	1	spool
Rope Bags, 100-ft. and 50-ft. with snap and ring on ends of line (2000-ft. minimum)	2000	feet
Sorbent, Oil, Blanket, 38" x 144-ft., 1/4" thick, Static Resistant	2	roll
Sorbent Pads (2A)	2	bundle
Sorbent Boom (8" or 5")	80	feet
Rags	1	box
Clear Bags (50 bags/box)	1	box
Manta Ray Skimmer Head	1	each
3" Diaphragm Pump	1	each
5-gallon Fuel Can, Diesel *(Inspect container for corrosion, leaks, or damage.)*	1	each
Secondary Containment, 24" minimum	1	each
Reinforced Visqueen, 20-ft. x 100-ft.	1	roll
Lanterns (*Replace batteries if past expiration date and perform function test on lights.)*	4	each
Radio Charger	1	each
Two-step Ladder	1	each
5/8" Shackles	6	each
1/2" Shackles	6	each
7/16" Shackles	6	each
3/8" Shackles	6	each
Aluminum anchor plates with 2 each 5/8 shackles *(This is not part of the conex independent shackle inventory.)*	3	each
KIT, HELICOPTER SLING		
Safety Goggles	2	each
Ear Plugs	12	pair
Boat Crew Helmet *(Replace if past expiration date.)*	2	each
Safety Glasses, clear is recommended	2	each
Lineman OR rubber-insulated gloves. *(Perform visual inspection for damage and replace with thick rubber gloves as needed)*	2	pair
10-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
20-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
Cargo Nets, approx 20-ft. x 20-ft.	2	each
3/4 inch shackles	2	each

TABLE 3-20 (CONTINUED) STANDARD CONEX INVENTORY (187)

Description	Quantity	Unit
KIT, RAFT	1	each
Inflatable raft	1	each
Boat Anchor, with 50Ft. Anchor Line, 15#	1	each
Raft Pump	1	each
PFDs	2	each
Paddles, 60", Alumn	2	each
Oars	2	each
Boards for Raft Floor	1	set
Raft Patch Kit	1	each
Bag to Carry Boat	1	each
FOL-DA-TANK, 1000 GALLON (3 EACH NEEDED)		
1000 gallon Fol-da-Tank or equivalent	3	each
2" Plug	3	each
3" Plug	3	each
Ground Pad for Tank	3	each
Clamshell Clamps for Liner Repair	3	each
2" or 3" ball valve assembly	3	each
PUMP, DIAPHRAGM, DIESEL		
Pump, Diaphragm, 3", Diesel, Yanmar	1	each
SKIMMER, OLEOPHILIC, ROPE, MOP, SYSTEM		
Rope mop power head	1	each
Downhole attachment (not need for sump rope mops)	1	each
Float pulley	1	each
Rope Mop 100' (minimum length)	2	each
2" X 50' discharge hose	2	each
Sledge hammer (found in tool barrel in trailers)	1	each
2" ball valve assembly	1	each
Steel stakes (found in tool barrel in trailers)	6	each
Barrel with lid and clamp (sump rope mops not needed)	1	each
Drip pan	1	each
Rope throw bag 100'	3	each
Rope throw bag 50'	2	each
SKIMMER, OLEOPHILIC, ROPE, MOP, POWER HEAD, ELECTRIC		
Skimmer, Oleophilic, Rope Mop, Power Head, Electric	1	each
GENERATOR		
Generator(s), minimum total capacity 3KW	varies	each
BOOM, TOW/ANCHOR BRIDLES		
Boom, Fastwater, 6" x 4" x 33', 9 sections	varies	feet
Boom, Containment, 8" x 8" x 33', 2 sections	varies	feet
Tow Bridles	varies	each
Anchor Bridles	varies	each

TABLE 3-21 ENHANCED STANDARD CONEX INVENTORY (188)[1]

Description	Quantity	Unit
PUMP, DIAPHRAGM, 3", DIESEL		
Pump, Diaphragm, 3", Diesel	1	each
KIT, HELICOPTER SLING	1	each
Safety Goggles	2	each
Ear Plugs	12	pair
Boat Crew Helmet (Replace if past expiration date.)	2	each
Safety Glasses, clear is recommended	2	each
Lineman OR Rubber Insulated Gloves. Perform visual inspection for damage and replace with thick rubber gloves as needed	2	pair
10-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
20-ft. Helicopter Sling with Ball Bearing Swivel Hook	2	each
Cargo Nets, approx 20-ft. x 20-ft.	2	each
3/4 inch shackles	2	each
KIT, RAFT	1	each
Inflatable raft	1	each
Boat Anchor, with 50 ft. Anchor Line	1	each
Raft Pump	1	each
PFDs	2	each
Raft Paddles, Alumn	2	each
Raft Floor Boards	1	set
Raft Patch Kit	1	each
Bag to Carry Raft	1	each
FOL-DA-TANK, 3000 GALLON	1	each
3000 gallon Fol-da-Tank, or equivalent tankage	1	each
2" or 3" Ball valve assembly	1	each
2" or 3" Plug	1	each
Ground Pad for Tank	1	each
Clamshell Clamps for Liner Repair	1	each
BOOM, TOW/ANCHOR BRIDLES		
Boom, Fastwater, 6" x 4" x 33', 30 sections	varies	feet
Boom, Containment, 8" x 8" x 33', 1 section	varies	feet
Anchor Bridles	varies	each
Tow Bridles	varies	each
TOOL BOX AND CONEX ACCESSORIES		
Inside Conex, Outside of Tote		
Rebar caps	25	each
Binders or manuals of conex equipment or materials, as needed	1	each
Step Ladder	1	each
Light Stand	1	each
1" x 10 ft Conduit (Pole For Windsock, f/Landing Zone Kit)	1	each
Extension Cord	1	each
5-gallon Fuel Can (Diesel)	1	each

TABLE 3-21 (CONTINUED) ENHANCED STANDARD CONEX INVENTORY (188)[1]

Description	Quantity	Unit
Landing Zone Kit		
Windsock Frames	1	each
Windsocks	2	each
Additional Boom Accessory Kit		
600ft of 1/2" Poly Line	1	spool
Duck Bill Anchors	20	each
Steel Stakes	10	each
50ft Rope Bags	3	each
100ft Rope Bags	20	each
Carabiners	30	each
Ascenders	10	each
Pulleys	5	each
Come-a-Longs	2	each
Tool Barrel		
55-gallon Drum, Tool Barrel	1	each
Rakes	2	each
8lbs Sledge Hammers	2	each
Picks/Mattocks	2	each
Square Shovels (5 ft or 4 ft)	2	each
Round Shovels	2	each
Pitch Forks	2	each
Wrecking Bars, approx 60"	2	each
Axes	2	each
Fence Post Driver	1	each
Duckbill Driver	1	each
Steel Fence Posts, 6 ft	10	each
Tool Kit		
Radio Charger	1	each
Lanterns w/Batteries	4	each
Tool Box		
Pry Bars, "Wonder Bar", 1-3/4" W x 12-3/8" L, Forged High Carbon Steel	2	each
Handsaw	1	each
Channel Lock Pliers, 6"	1	each
Channel Lock Pliers, 10"	1	each
3/8" Socket Set w/Ratchet	1	each
Claw Hammer	1	each
Needle Nose Pliers	1	each
Lineman Pliers / side cutters	1	each
Crescent Wrench, 10"	2	each
Vise Grip	1	each
Tie Wire	1	roll
Hose Gaskets, 2"	2	each
Hose Gaskets, 3"	2	each

TABLE 3-21 (CONTINUED) ENHANCED STANDARD CONEX INVENTORY (188)[1]

Description	Quantity	Unit
Screwdriver Combo Set, Phillips/Straight Tip		
Phillips, #1, 6"	1	each
Phillips, #2, 6"	1	each
Flat, 10"	1	each
Flat, 8"	1	each
Flat, 6"	1	each
Flat, 10"	1	each
Hose and Hose Accessories Kit		
Discharge Hose- 3" x 50ft w/Caps & Plugs	200	feet
Suction Hose 3" x 18ft w/Caps & Plugs	90	feet
Discharge Hose, 2" x 50 ft	150	feet
3" Hose Floats	20	each
Sorbent Accessories Kit		
Sorbent Pads, approx 17" x 19", Static Resistant (100/bale)	2	each
Sorbent Boom (8" or 5")	80	feet
Reinforced Visqueen, 20 ft x 100 ft	1	roll
Rags	1	box
Sorbent, Oil, Blanket, 144"L x 38"W, 1/4" Thk, Static Resistant	2	roll
Duct Tape	1	roll
Clear Garbage Bags, 55-gallon, 50/box	1	box
PPE Kit		
Tyvek Suits, XL	4	each
Replace respirators if they will expire before next year's inventory PM cycle.		
Respirators, MED	2	each
Respirators, LG	2	each
Rain suits assorted sizes (M, L, XL)	4	each
Hip Boots	2	pair
Rubber Gloves	4	pair
First Aid Kit (Visually inspect inventory contents.)	1	each
5/8" Shackles	6	each
1/2" Shackles	6	each
7/16" Shackles	6	each
3/8" Shackles	6	each
Manta Ray Skimmer, or equivalent	1	each
Aluminum anchor plates with 2 each 5/8 shackles. This is not part of the conex independent shackle inventory.	3	each
SKIMMER, OLEOPHILIC, ROPE, MOP, SYSTEM	1	each
Downhole attachment (not needed for sump rope mops)	1	each
Float pulley	1	each
Rope Mop 100' (minimum length)	2	each
2" X 50' discharge hose	2	each
Sledge hammer (found in tool barrel in trailers)	1	each
2" ball valve assembly	1	each
Steel stakes (found in tool barrel in trailers)	6	each

TABLE 3-21 (CONTINUED) ENHANCED STANDARD CONEX INVENTORY (188)[1]

Description	Quantity	Unit
Barrel with lid and clamp (sump rope mops not needed)	1	each
Drip pan	1	each
Rope throw bag 100'	3	each
Rope throw bag 50'	2	each
SKIMMER, ROPE MOP POWER HEAD		
Rope mop power head	1	each
GENERATOR		
Generator(s),minimum total capacity 3KW	varies	each

3.6.6 Containment Site Inventory Data Sheets

This section provides conex inventories at TAPS containment sites. Kit contents can be found in the trailer inventories provided in Table 3-14 through Table 3-19. The Underflow Dam Kit (Standard) contents are provided in Table 3-24.

TABLE 3-22 UNDERFLOW DAM KIT (STANDARD) CONTENTS

Description	Quantity	Unit
20' x 100' reinforced sheeting, "Visqueen"	1	roll
Hand saw	1	each
Sledge hammer, 3#	1	each
Stake, steel, 3/4" diameter x 3' long	4	each
Rope, 3/8" poly, 100' long	1	coil

S 1-1A, Sag River

Sag River below Endicott Bridge

Pump Station 1 Asset Area

04-187-001 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each

04-189-062 Auxiliary Conex

Description	Quantity	Unit
Boom, Fastwater, 6" x 4" x 33', 40 sections	1320	ft
Boom, Containment, 8" x 8" x 33', 6 sections	198	ft
Tow Bridles	10	each
Anchor Bridles	50	each

CS 2-0, Sag River

LWC at 125 APL-4

Conexes are staged at PS02 for part of the year to avoid high-water break-up damage.
Pump Station 3 Asset Area

04-187-002 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each

04-189-047 Auxiliary Conex

Description	Quantity	Unit
Culvert Block, Timbers (4" x 4" x 6' Treated Timbers)	12	each
Sandbag, totes, full, w/filled sandbags, quantity varies	1	tote
Boom, Fastwater, 6" x 4" x 33', 27 sections	891	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Tow Bridles	6	each
Anchor Bridles	25	each

CS 2-1, Dan Creek

Dalton Highway where Dan Creek meets the Sag River

Pump Station 3 Asset Area

04-189-050 Auxiliary Conex

Description	Quantity	Unit
Generator, 2KW, Gas	2	each
Skimmer, Aqua Guard, System	1	each
Kit, Brush	1	kit
Kit, Ice	1	kit
Portable Shelter	1	each
Berm Liner (Polyliner & Geo-Fabric), Tundra	1	each
Dam, Portable, MegaSecur 28"	1	each
Fol-Da-Tank, 3000 Gallon	1	each

04-189-051 Auxiliary Conex

Description	Quantity	Unit
Boom, Skorboom, 4" x 4" x 50'	500	ft
Boom, Fastwater, 6" x 4" x 33', 60 sections	1980	ft
Anchor Bridles	40	each
Pallet, Lumber	1	each
Tow Bridles	2	each
Sandbag, totes, full, w/filled sandbags, quantity varies	1	tote
Kit, Helicopter Sling	1	kit

CS 2-2, Lori Creek

Dalton Highway Crossing of Lori Creek

Pump Station 2 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
PVC Pipe, 8" x 8'	4	each
Plywood, 3/4" x 4' x 8'	6	each
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
Kit, Underflow Dam (Standard)	1	kit

CS 2-3, Unnamed Creek

0.6 Miles to the left of the Dalton Hwy

Pump Station 2 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Boom, Skorboom, Tote, 4" x 4" x 50' (2 lengths)	100	ft
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
Kit, Underflow Dam (Standard)	1	kit
Lumber, Plywood, 1" x 4' x 8', Marine Grade	5	each

CS 2-4A, Unnamed Creek

Dalton Hwy Crossing of Unnamed Creek

Pump Station 2 Asset Area

04-189-052 Auxiliary Conex

Description	Quantity	Unit
Boom, Skorboom, Tote, 4" x 4" x 50' (2 Lengths)	100	ft
Kit, Underflow Dam (Standard)	1	kit
Visqueen, Reinforced, 10 mil, 20' x 100' Roll	1	each
Culvert Block, Timbers (4" x 4" x 6' Treated Timbers)	15	each
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 2-5, Sag River
On 121 APL-1 at Sag River Channel
Pump Station 3 Asset Area

04-187-003 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each

04-189-061 Auxiliary Conex

Description	Quantity	Unit
Dam, Portable, MegaSecur 28"	2	each
Boom Vane, Shallow Water	2	each
Boom, Fastwater, 6" x 4" x 33', 42 sections	1386	ft
Boom, Containment, 8" x 8" x 33'L, 3 sections	99	ft
Anchor Bridles	33	each
Tow Bridles	6	each

CS 2-8, Oks Creek
Pipeline Crossing of Oks Creek
Pump Station 2 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Culvert Block, Timbers (4" x 4" x 6' Treated Timbers)	10	each
Culvert Block, Timbers (4" x 4" x 6' Treated Timbers)	8	each
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote

CS 3-3, Unnamed Drainage

Unnamed Drainage Crossing of the Dalton Hwy

Pump Station 2 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote

CS 3-3A, Oks Creek

Oks Creek near the Dalton Highway

Pump Station 2 Asset Area

04-189-053 Auxiliary Conex

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each
Boom, Skorboom, Tote, 4" x 4" x 50' (2 Lengths)	100	ft

CS 3-4, Oks Creek

Oks Creek Crossing of the Work Pad

Pump Station 2 Asset Area

04-189-054 Auxiliary Conex

Description	Quantity	Unit
Boom, Skorboom, Tote, 4" x 4" x 50' (2 Lengths/Tote)	50	ft
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 3-9, Oks Creek

Oks Creek Crossing of the Dalton Highway

Pump Station 2 Asset Area

04-189-055 Auxiliary Conex

Description	Quantity	Unit
Boom, Skorboom, Tote, 4" x 4" x 50' (2 Lengths)	100	ft
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 3-11, East Fork Kuparuk River

East Fork Kuparuk River

Pump Station 2 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Boom, Skorboom, Tote, 4" x 4" x 50' (2 Lengths)	100	ft
Lumber, Plywood, 1" x 4' x 8', Marine Grade	4	each
Accessories, Skorboom (8 stakes, 1 hammer, 100' polyrope)	1	each
Boom Anchor Plates, Aluminum	4	each

CS 3-12, Kuparuk River
Kuparuk River Crossing of the Old Winter Road
Pump Station 3 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Boom, Skorboom, Tote, 4" x 4" x 50' (2 Lengths/Tote)	50	ft
Lumber, Plywood, 1" x 4' x 8', Marine Grade	4	each
Accessories, Skorboom (8 stakes, 1 hammer, 100' polyrope)	1	each
Boom Anchor Plates, Aluminum	4	each

CS 3-15, Becky Creek
Becky Creek Crossing of 116 APL-6 Road
Pump Station 4 Asset Area

04-187-004 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each
Boom, Fastwater, 6" x 4" x 33', 9 sections	297	ft
Boom, Containment, 8" x 8" x 33', 1 sections	33	ft
Tow Bridles	2	each
Anchor Bridles	10	each

CS 3-15A, Kuparuk River

Kuparuk River Crossing of the Dalton Highway

Pump Station 4 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Dam, Portable, MegaSecur 21"	2	each
Dam, Portable MegaSecur 28"	2	each

CS 3-19, Kuparuk River Tributary
Outlet of Toolik Lake
Pump Station 4 Asset Area

04-187-005 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each
Boom, Fastwater, 6" x 4" x 33', 3 sections	99	ft
Boom, Containment, 8" x 8" x 33', 1 sections	33	ft
Tow Bridles	2	each
Anchor Bridles	4	each

CS 3-22, Galbraith Lake Slough

Galbraith Lake Slough

Pump Station 4 Asset Area

04-189-058 Auxiliary Conex

Description	Quantity	Unit
Kit, Decon	1	kit
Kit, Ice	1	kit
Boom, Fastwater, 6" x 4" x 33', 15 sections	495	ft
Hip Boots, Size 11	4	each
Skimmer, Aqua Guard, System	1	each
Kit, Brush	1	kit
Pallet, Lumber	1	each
Skimmer, Weir, Pedco, 2', System	1	each
Visqueen, Reinforced, 10mil, 20' x 100' Roll	1	each
Berm Liner (Polyliner & Geo-Fabric), Tundra	1	each
Portable Shelter	1	each

CS 3-23, Atigun River

Atigun River

Pump Station 4 Asset Area

04-187-006 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each
Boom, Fastwater, 6" x 4" x 33', 9 sections	297	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Tow Bridles	4	each
Anchor Bridles	10	each

CS 3-26, Galbraith Tributary

Tributary Crossing of Galbraith Airport Road

Pump Station 4 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Culvert Block, Timbers (4" x 4" x 10' Treated Timbers)	20	each

CS 3-29, Atigun River

Atigun River near Dalton Highway Bridge

Pump Station 4 Asset Area

04-187-007 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each
Boom, Fastwater, 6" x 4" x 33', 21 sections	693	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Tow Bridles	6	each
Anchor Bridles	30	each

CS 3-31, Unnamed Creek
Small Drainage into Atigun River from a Pond
Pump Station 4 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Boom Anchor Plates, Aluminum	4	each
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 3-32, Atigun River

Atigun River near the Work Pad at (b) (7)(F),

Pump Station 4 Asset Area

04-188-044 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, 2KW, Gas	2	each
Dam, Portable, MegaSecur 28"	4	each
Boom, Fastwater, 6" x 4" x 33', 16 sections	528	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Anchor Bridles	31	each
Tow Bridles	4	each
Motor, Outboard, 15HP	1	each

CS 4-2, North Fork Chandalar River
Near North End of Chandalar Lake
Pump Station 4 Asset Area

04-187-008 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each
Boom, Fastwater, 6" x 4" x 33', 27 sections	891	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Anchor Bridles	30	each
Tow Bridles	6	each

CS 4-7, Dietrich River

Dietrich River near the Pipeline

Pump Station 4 Asset Area

04-188-045 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, 2KW, Gas	2	each
Dam, Portable, MegaSecur 28"	4	each
Anchor Bridles	11	each
Boom, Fastwater, 6" x 4" x 33', 10 sections	330	ft
Boom, Containment, 8" x 8" x 33', 6 sections	198	ft
Tow Bridles	6	each
Motor, Outboard, 15HP	1	each

CS 4-10, Dietrich River

Deitrich River near the Dietrich Camp

Pump Station 4 Asset Area

04-187-009 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, 2KW, Gas	2	each
Boom, Fastwater, 6" x 4" x 33', 21 sections	693	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Tow Bridles	4	each
Anchor Bridles	21	each

CS 4-16A, Middle Fork Koyukuk River

Middle Fork Koyukuk River

Pump Station 5 Asset Area

04-187-010 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 11 sections	330	ft
Boom, Containment, 8" x 8" x 33', 3 sections	99	ft
Tow Bridles	4	each
Anchor Bridles	13	each

CS 4-17, South Fork Koyukuk River

South Fork Koyukuk River 9 Miles Downstream of Pipeline

Pump Station 5 Asset Area

04-187-011 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 9 sections	297	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Tow Bridles	4	each
Anchor Bridles	10	each

CS 4-20, South Fork Koyukuk River

Confluence of Unnamed Creek and South Fork Koyukuk River 2 Miles Downstream of Pipeline

Pump Station 5 Asset Area

04-187-012 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 9 sections	297	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Tow Bridles	4	each
Anchor Bridles	10	each

CS 4-21, South Fork Koyukuk River
On the South Side of South Fork Koyukuk River
Pump Station 5 Asset Area

04-187-013 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 9 sections	297	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Tow Bridles	4	each
Anchor Bridles	10	each

CS 4-26, Jim River

At the Jim River Approximately 2 Miles from Prospect Camp

Pump Station 5 Asset Area

04-187-014 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 8 sections	264	ft
Boom, Containment, 8" x 8" x 33', 1 sections	33	ft
Tow Bridles	2	each
Anchor Bridles	9	each

CS 4-29, Grayling Creek

Grayling Creek, Second CS from South Exit Point of Grayling Lake

Pump Station 5 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	1	tote
12" x 10' pipe, PVC	6	each

CS 5-10, Unnamed Creek

Confluence of Kanuti and Unnamed Creek Downstream from [redacted]

Pump Station 5 Asset Area

04-187-015 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 8 sections	264	ft
Boom, Containment, 8" x 8" x 33', 1 sections	33	ft
Tow Bridles	2	each
Anchor Bridles	9	each

CS 5-24, Unnamed Creek #9

Site at Confluence of Unnamed Creek #9 and Ray River

Pump Station 6 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	1	tote
12" x 10' pipe, PVC	6	each

CS 5-29, Unnamed Drainage

Site at Confluence of Unnamed Drainage and Yukon River

Pump Station 6 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	1	tote
12" x 10' pipe, PVC	6	each

CS 6-2, Isom Creek

Confluence of Isom Creek and Yukon River, Stored at YRB

Pump Station 6 Asset Area

Additional Inventory

Description	Quantity	Unit
Tote, Sorbent Boom, 8in x 10ft (8 sections/tote)	80	ft
Dam, Portable, MegaSecur 28"	1	each
Boom, Fastwater, 6" x 4" x 33' , 2 sections	66	ft
Boom, Containment, 8" x 8" x 33', 1 section	33	ft

CS 6-4, Unnamed Creek

Confluence of Unnamed Creek and Isom Creek

Pump Station 6 Asset Area

04-188-038 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Boom, Fastwater, 6" x 4" x 33', 3 sections	99	ft
Generator, Diesel, 4KW	1	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Anchor Bridles	4	each

04-189-039 Auxiliary Conex

Description	Quantity	Unit
Blower, Air, Centrifugal, Gas	1	each
Boom, Intertidal, W/Bags & Bridles (Mini-Shoreguardian) 20 sections, 25' lengths	500	ft
Kit, Decon	1	kit
Skimmer, Weir, Pedco, 2', System	1	each
Portable Shelter	1	each
Pump, Centrifugal, 2", Honda, Mini-Shoreguardian Boom	1	each

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbags (empty)	308	each
Sandbag, totes, full, w/filled sandbags, quantity varies; 4 totes are in YRB yard 4 totes at site.	8	tote
12" x 10' pipe, PVC	6	each
ATV, Six-wheeled, w/Trailer (Stored AT YRB)	2	each

CS 6-6, Hess Creek

Hess Creek

Pump Station 6 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Tote, Sorbent Boom, 8in x 10ft (8 sections/tote)(2 totes)	160	ft

CS 6-11A, Hess Creek
Confluence of Hess Creek and Unnamed Creek
Pump Station 6 Asset Area

04-189-016 Auxiliary Conex

Description	Quantity	Unit
Skimmer, Weir, Pedco, 2', System	1	each
Generator, 2KW, Gas	2	each
Portable Shelter	1	each
Kit, Helicopter Sling	1	kit
Kit, Raft	1	kit
Kit, Brush	2	kit
Kit, Ice	1	kit
Tool Box and Conex Accessories	1	each
Kit, Decon	1	kit
Skimmer, Oleophilic, Rope, Mop, System	1	each

04-189-040 Auxiliary Conex

Description	Quantity	Unit
Fol-da-Tank, 1000 Gallon	3	each
Fol-Da-Tank, 3000 Gallon	2	each
Kit, Underflow Dam (Standard)	1	kit
Motor, Outboard, 5 HP	1	each
Dam, Portable, Megasecur 28"	1	each
Dam, Portable, Megasecur 28"	1	each
Tool Box and Conex Accessories (Site Specific)	1	each
Boom, Fastwater, 6" x 4" x 33', 22 sections	726	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Anchor Bridles	20	each
Tow Bridles	4	each
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote

Additional Inventory on Site

Description	Quantity	Unit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
Berm Liner (Polyliner & Geo-Fabric), Tundra	1	each

CS 6-11B, Hess Creek
Pipeline Crossing of Hess Creek
Pump Station 6 Asset Area

04-187-017 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 6 sections	198	ft
Boom, Containment, 8" x 8" x 33', 1 sections	33	ft
Tow Bridles	2	each
Anchor Bridles	6	each

04-189-041 Auxiliary Conex

Description	Quantity	Unit
Kit, Decon	1	kit
Kit, Brush	1	kit
Boom, Fastwater, 6" x 4" x 33', 3 sections	99	ft
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Boom, Skorboom, 4" x 4" x 50'	500	ft
Skimmer, Aqua Guard, System	1	each
Tow Bridles	1	each

04-189-042 Auxiliary Conex

Description	Quantity	Unit
Fol-Da-Tank, 3000 Gallon	1	each
Boom Vane, Shallow Water	1	each
Kit, Ice	1	kit
Portable Shelter	1	each
Berm Liner (Polyliner & Geo-Fabric), Tundra	1	each

CS 6-11C, Hess Creek

Hess Creek

Pump Station 6 Asset Area

04-187-018 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 20 sections	660	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Tow Bridles	4	each
Anchor Bridles	17	each

CS 6-11D, Hess Creek

Hess Creek

Pump Station 6 Asset Area

04-188-043 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33'L, 8 sections	264	ft
Boom, Containment, 8" x 8" x 33'L, 1 section	33	ft
Anchor Bridles	9	each

CS 6-13, Unnamed Creek
Hess Creek below CS 6-11A
Pump Station 6 Asset Area

04-189-045 Auxiliary Conex

Description	Quantity	Unit
Culvert Block (For 24" Culvert)	15	each
Culvert Block (For 36" Culvert)	2	each
Culvert Block (For 72" Culvert)	1	each
Kit, Underflow Dam (Standard)	1	kit
12" x 10' pipe, PVC	6	each
Culvert Block (For 60" Culvert)	1	each

04-189-046 Auxiliary Conex

Description	Quantity	Unit
ATV, Six-wheeled, w/Trailer	2	each

Additional Inventory on Site

Description	Quantity	Unit
Plywood, 5/8" x 4' x 8' (1 Bunk)	1	each
Sandbag, totes, full, w/filled sandbags, quantity varies	8	tote

CS 6-16, Fish Creek

Confluence of Fish Creek and Hess Creek

Pump Station 6 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Dam, Portable, MegaSecur 28"	2	each

CS 6-23, Erickson Creek #2
Pipeline Crossing of Erickson Creek
Pump Station 6 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Dam, Portable, MegaSecur 28"	2	each

CS 6-24, Erickson Creek #1
Pipeline Crossing of Erickson Creek
Pump Station 6 Asset Area

04-188-047 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33'L, 3 sections	99	ft
Boom, Containment, 8" x 8" x 33'L, 1 section	33	ft
Anchor Bridles	4	each

04-189-048 Auxiliary Conex

Description	Quantity	Unit
Pallet, Lumber	1	each
Portable Shelter	1	each
Skimmer, Skimpak, System	1	each
Kit, Underflow Dam (Standard)	1	kit
12" x 10' pipe, PVC	6	each
Kit, Decon	1	kit

Additional Inventory on Site

Description	Quantity	Unit
Sandbag, totes, full, w/filled sandbags, quantity varies	8	tote

CS 6-25, Erickson Creek
Low Water Crossing of ROW
Pump Station 6 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Sandbag, totes, full, w/filled sandbags, quantity varies	8	tote
Sandbags (empty)	100	each

Rampart Conex

Pump Station 6 Asset Area

04-187-019 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 9 sections	297	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Tow Bridles	4	each
Anchor Bridles	7	each

CS 6-26, West Fork Tolovana River

Manley Springs Road Crossing of West Fork Tolovana River, Located at RGV 65

Pump Station 7 Asset Area

04-188-046 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Dam, Portable, MegaSecur 28"	2	each
Boom, Fastwater, 6" x 4" x 33', 10 sections	330	ft
Anchor Bridles	11	each
Tow Bridles	4	each
Motor, Outboard, 15HP	1	each
Boom, Containment, 8" x 8" x 33'L, 4 sections	132	ft

CS 6-34, Wilber Creek
Pipeline Crossing of Wilber Creek
Pump Station 7 Asset Area

04-189-065 Auxiliary Conex

Description	Quantity	Unit
Culvert Block, Timbers (4" x 4" x 10' Treated Timbers)	8	each
Pallet, Lumber	1	each
Dam, Portable, MegaSecur 21"	2	each

CS 6-35, Tatalina River

Tatalina River

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Raft	1	kit
Boom, Fastwater, 6" x 4" x 33', 5 sections	165	ft
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Anchor Bridles	3	each
Steel Stakes	5	each
Rope bags, 50 ft line	4	each

CS 6-37, Slate Creek

Slate Creek below the Pipeline

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 6-38, Slate Creek

Slate Creek above the Pipeline

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Tote, Sorbent Boom, 8in x 10ft (8 sections/tote)	80	ft
Culvert Block, Timbers (4" x 4" x 10' Treated Timbers)	8	each

CS 7-3, Globe Creek

Globe Creek Crossing of the Elliot Highway

Pump Station 7 Asset Area

Additional Inventory Stored at PS07

Description	Quantity	Unit
Boom, Fastwater, 6" x 4" x 33', 4 sections	132	ft
Anchor Bridle	6	each
Tow Bridles	1	each
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Dam, Portable, MegaSecur 21"	1	each

CS 7-4, Globe Creek

Globe Creek, Downstream of the Pipeline

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Tote, Sorbent Boom, 8in x 10ft (8 sections/tote)	160	ft
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 7-5, Little Globe Creek

Pipeline Crossing of Little Globe Creek

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Culvert Block, Timbers (4" x 4" x 10' Treated Timbers)	12	each

CS 7-6, Tributary Creek

Pipeline Crossing of Tributary Creek

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	1	tote
12" x 10' pipe, PVC	6	each
Tote, Sorbent Boom, 8in x 10ft (8 sections/tote)	80	ft

CS 7-9, Enigma Creek

Enigma Creek Confluence with Aggie Creek

Pump Station 7 Asset Area

Additional Inventory on Site

Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
PVC, Pipe, 8" x 10'	6	each

CS 7-10, Branch Creek

Branch Creek Confluence with Aggie Creek

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
PVC, Pipe, 10" x 10'	4	each

CS 7-18, Shocker Creek

Shocker Creek, Approximately 2 Miles from the Pipeline

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
PVC, Pipe, 10" x 10'	6	each

CS 7-33A, Chena River

Chena River

Pump Station 7 Asset Area

04-189-064 Auxiliary Conex

Description	Quantity	Unit
Motor, Outboard, 35 HP	1	each
Skimmer, Oleophilic, Rope, Mop, System (stored at FRB)	1	each
Generator, Diesel, 3KW (stored at FRB)	1	each
Skimmer, Weir, Pedco, 2', System (stored at FRB)	1	each
Pump, Centrifugal, 2", Diesel, Pedco Skimmer (stored at FRB)	1	each
Boat, aluminum, 16'	1	each
Line, spool, 1/2" x 600 ft	1	each
Sorbent Boom in Clear Bags, 10'L (8 sections)	80	ft
Sorbent, Rolls, 38" x 144"	2	each
Sorbent, Pads, count of 100	2	each
Boom, Fastwater, 6" x 4" x 33', 19 sections	627	ft
Boom, Containment, 8" x 8" x 33', 3 section	99	ft
Anchor Bridles	14	each
Tow Bridles	4	each
Personal Flotation Devices, Assorted	12	each

CS 8-2, Unnamed Creek

Near the Confluence of Unnamed Creek and the Salcha River

Pump Station 8 Asset Area

04-188-049 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 2 sections	66	ft
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Anchor Bridles	4	each
Kit, Decon, tote	1	kit
Kit, Ice	1	kit
Portable Shelter	1	each

Additional Inventory on Site

Description	Quantity	Unit
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
Berm Liner (Polyliner & Geo-Fabric), Tundra	1	each
Pallet, Lumber	1	each

CS 8-4, Gnat Creek

Gnat Creek Confluence with Salcha River

Pump Station 7 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Tote, Sorbent Boom, 8in x 10ft (8 sections/tote)	160	ft
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 8-6A, Salcha River
Pipeline Crossing of the Salcha River
Pump Station 7 Asset Area

04-187-020 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 12 sections	396	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft
Tow Bridles	4	each
Anchor Bridles	11	each

CS 8-7, Redmond Creek

Redmond Creek

Pump Station 9 Asset Area

Additional Inventory Stored at PS09

Description	Quantity	Unit
Dam, Portable, MegaSecur 28"	2	each

CS 8-8, Minton Creek
Pipeline Crossing of Minton Creek
Pump Station 9 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	5	tote
PVC, Pipe, 8" x 10'	6	each

CS 8-12, Shaw Creek
Richardson Highway Crossing of Shaw Creek
Pump Station 9 Asset Area

04-188-036 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 30 sections	990	ft
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Tow Bridles	2	each
Anchor Bridles	20	each

CS 8-14, Delta River

Delta Concrete Plant, Stored at PS09 Yard

Pump Station 9 Asset Area

04-189-063 Auxiliary Conex

Description	Quantity	Unit
Boom Vane, Shallow Water	4	each
Boom, Fastwater, 6" x 4" x 33', 60 sections	1980	ft
Shackles	1	Kit
Boom, Containment, 8" x 8" x 33'L, 1 section	33	ft
Boom, Fastwater, 6" x 4" x 33', 30 sections	990	ft
Tow Bridles	2	each
Anchor Bridles	35	each

CS 8-16, Tanana River

Tanana River

Pump Station 9 Asset Area

04-188-037 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Boom, Fastwater, 6" x 4" x 33', 30 sections	990	ft
Anchor Bridles	30	each
Tow Bridles	4	each

04-189-059 Auxiliary Conex

Boom Vane, Shallow Water	4	each
Boom, Fastwater, 6" x 4" x 33', 30 sections	990	ft
Rope, 1/2" X 100', W/Thimble	60	each

CS 10-4, Good Buddy Creek

Confluence of Good Buddy Creek with Phelan Creek

Pump Station 9 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
12" x 10' pipe, PVC	6	each
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote

CS 10-5, Wonder Creek

On dry creek above Phelan Creek

Pump Station 9 Asset Area

Additional Inventory on Site

Description	Quantity	Unit
Kit, Underflow Dam (Standard)	1	kit
Sandbag, totes, full, w/filled sandbags, quantity varies	2	tote
12" x 10' pipe, PVC	6	each

CS 10-17, Gulkana River

26 APL-2 Crossing of Gulkana River

Pump Station 11 Asset Area

04-187-023 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 3KW	1	each
Boom, Fastwater, 6" x 4" x 33', 27 sections	891	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Tow Bridles	6	each
Anchor Bridles	31	each

CS 11-2A, Willow Lake

Richardson Highway above Willow Lake

Pump Station 12 Asset Area

04-188-024 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	2	each
Boom, Fastwater, 6" x 4" x 33', 2 sections	66	ft
Anchor Bridles	4	each
Motor, Outboard, 15 HP	1	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft

04-189-025 Auxiliary Conex

Description	Quantity	Unit
Motor, Outboard, 15 HP	1	each
Kit, Raft	1	kit
Kit, Barricade	1	kit
Portable Shelter	1	each
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
Kit, Ice	1	kit
Personal Flotation Devices, size XL	2	each
Boom, Skorboom, 4" x 4" x 50'	500	ft
Tank, Bladder, Portable, 300 Gallon	2	each
Generator, Diesel, 4KW	1	each

CS 11-3, Willow Creek
Edgerton Highway Crossing of Willow Creek
Pump Station 12 Asset Area

04-188-026 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 2 sections	66	ft
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Anchor Bridles	4	each

04-189-027 Auxiliary Conex

Description	Quantity	Unit
Kit, Ice	1	kit
Portable Shelter	1	each
Boom, Skorboom, 4" x 4" x 50'	600	ft
Generator, Diesel, 4KW	1	each
Kit, Underflow Dam (Standard)	1	kit
Kit, Barricade	1	kit
Ladder, Extension, 30 Ft., Fiberglass	2	each
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
12" x 10' pipe, PVC	6	each

CS 11-6, Little Tonsina River

14 APL-4 Crossing of the Little Tonsina River

Pump Station 12 Asset Area

04-188-028 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Boom, Fastwater, 6" x 4" x 33', 10 sections	330	ft
Anchor Bridles	9	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft

04-189-029 Auxiliary Conex

Description	Quantity	Unit
Portable Shelter	1	each
Kit, Barricade	1	kit
Boom, Skorboom, 4" x 4" x 50'	500	ft
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
Kit, Ice	1	kit
Generator, Diesel, 4KW	1	each

Additional Inventory on Site

Description	Quantity	Unit
Kit, Raft, Inflatable, boat, Zodiac, Futura Mark 2 HD, 13 feet 5 inches Located at GRB	1	kit

CS 11-7, Little Tonsina River

Little Tonsina River just North of PS12

Pump Station 12 Asset Area

04-188-030 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	1	each
Portable Shelter	1	each
Boom, Fastwater, 6" x 4" x 33', 7 sections	231	ft
Anchor Bridles	6	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft

04-189-031 Auxiliary Conex

Description	Quantity	Unit
Kit, Barricade	1	kit
Kit, Ice	1	kit
Boom, Skorboom, 4" x 4" x 50'	500	ft
Kit, Underflow Dam (Standard)	1	kit
Generator, Diesel, 4KW	1	each
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
12" x 10' pipe, PVC	6	each
Culvert Block, Timbers (4" x 4" x 6' Treated Timbers)	12	each

CS 12-3, Tsina River

Tsina River near Stuart Creek, Stored at OMS 9-4

Pump Station 12 Asset Area

04-188-032 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard inventory	1	each
Generator, Diesel, 4KW	2	each
Motor, Outboard, 15 HP	1	each
Boom, Fastwater, 6" x 4" x 33', 7 sections	231	ft
Anchor Bridles	6	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft

04-189-033 Auxiliary Conex

Description	Quantity	Unit
Kit, Ice	1	kit
Boom, Skorboom, 4" x 4" x 50'	500	ft
Sandbag, totes, full, w/filled sandbags, quantity varies	4	tote
Portable Shelter	1	each
Mooring Line Bridles, Polyester, 2 tons working limit straight pull	2	each

CS 12-3A, Tsina River

8 APL-2 Crossing of the Tsina River

Pump Station 12 Asset Area

04-188-034 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard Inventory	1	each
Boom, Intertidal, W/Bags & Bridles (Mini-Shoreguardian) 10 sections, 25' lengths	250	ft
Generator, Diesel, 3.7KW	2	each
Boom Anchor Plates, Aluminum	2	each
Boom, Fastwater, 6" x 4" x 33', 18 sections	594	ft
Anchor Bridles	15	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Tow Bridles	2	each
Pump, Centrifugal, 2", Honda	2	each
Blower, Air, Centrifugal, Gas	2	each

CS 12-3C, Tiekel River

Tiekel River, Stored at OMS 9-4R

Pump Station 12 Asset Area

04-187-021 Standard Conex

Description	Quantity	Unit
Standard inventory	1	each
Generator, Diesel, 3KW	1	each
Boom, Fastwater, 6" x 4" x 33', 25 sections	825	ft
Boom, Containment, 8" x 8" x 33', 4 sections	132	ft
Tow Bridles	6	each
Anchor Bridles	23	each

CS 12-4, Ptarmigan Creek

7 APL-1A Access Road Crossing of Ptarmigan Creek

Pump Station 12 Asset Area

04-188-035 Enhanced Standard Conex

Description	Quantity	Unit
Enhanced standard Inventory	1	each
Generator, Diesel, 4KW	2	each
Portable Shelter	1	each
Kit, Ice	1	kit
Anchor Bridles	5	each
Boom, Containment, 8" x 8" x 33', 1 section	33	ft
Boom, Fastwater, 6" x 4" x 33', 5 sections	165	ft

Additional Inventory on Site

Description	Quantity	Unit
Sandbags, filled (quanities vary per tote)	4	tote

RGV100

Pump Station 12 Asset Area

04-186-040 Auxiliary Conex

Description	Quantity	Unit
Tank, Bladder, 10,000 Gallon Kit	1	each
Kit, Decon	1	kit
Pump, Diaphragm, 3", Diesel, Yanmar	1	each
Skimmer, Oleophilic, Minimax, Power Head, 70lbs.	1	each
Fol-Da-Tank, 3000 Gallon	2	each
Motor, Outboard, 15 HP	1	each
Powerpack/Pump, Spate, Diesel, 2-1/2" - 3", 75 C, 320lbs (for Minimax Skimmer)	1	each
Skimmer System, Oleophilic, Minimax	1	kit
Generator, Diesel, 3KW	1	each
Kit, Helicopter Sling	2	kit
Tool Box and Conex Accessories (RGV100)	1	each
Kit, Raft	1	kit

04-189-026 Auxiliary Conex

Description	Quantity	Unit
Boom Vane, Shallow Water	2	each
Kit, Brush	1	kit
Kit, Boom Accessories	2	kit
Kit, Gun, Line Throwing	1	kit
Danforth Anchors, 340lbs Gross (tote 1 of 2 at RGV100)	4	each
Danforth Anchors, 340lbs Gross (tote 2 of 2 at RGV100)	4	each
Boom Anchor Plates and Stakes, Tote, 580lbs Gross	1	each
Boom, Fastwater, 6" x 4" x 33', 25 sections	825	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft

RGV102

Pump Station 12 Asset Area

04-186-041 Auxiliary Conex

Description	Quantity	Unit
Generator, Diesel, 4KW	1	each
Tank, Bladder, 10,000 Gallon Kit	1	each
Kit, Decon	1	kit
Skimmer, Oleophilic, Minimax, Power Head, 70lbs.	1	each
Fol-Da-Tank, 3000 Gallon	2	each
Motor, Outboard, 15 HP	1	each
Powerpack/Pump, Spate, Diesel, 2-1/2" - 3", 75 C, 320lbs (for Minimax Skimmer)	1	each
Skimmer System, Oleophilic, Minimax	1	kit
Pump, Diaphragm, 3", Diesel, Yanmar	1	each
Kit, Helicopter Sling	2	kit
Tool Box and Conex Accessories (RGV102)	1	each
Kit, Raft	1	kit

04-189-028 Auxiliary Conex

Description	Quantity	Unit
Kit, Brush, 120lbs Gross	1	kit
Boom Vane, Shallow Water	2	each
Kit, Boom Accessories	2	kit
Kit, Gun, Line Throwing (25lbs)	1	kit
Danforth Anchors, 340lbs Gross (tote 1 of 2 at RGV102)	4	each
Danforth Anchors, 340lbs Gross (tote 2 of 2 at RGV102)	4	each
Boom Anchor Plates and Stakes, Tote, 580lbs Gross	1	each
Boom, Fastwater, 6" x 4" x 33' (27 sections)	891	ft
Boom, Containment, 8" x 8" x 33', 2 sections	66	ft

TABLE 3-23 SOURCE CONTROL AND REPAIR EQUIPMENT

Located at the Fairbanks Region Response Base on Nordale Road	
Tri-Max Fire Foam/AFFF Skids	*Quantities withheld for security reasons.*
Industrial Scientific Gas Monitors	
SCBA Breathing Apparatus	
Specialized Fire Fighting Proximity PPE	
Decontamination Module	
Exclusion Zone Kits	
Insulation Removal Kits	
Specialized Non-Sparking Tool Kits	
Equipment Bonding Kits	
Nitrogen Bottle Re-Supply Kit	
10,000-Gallon Storage Bladders	
4" Portable Aluminum Pipeline Transfer Kit	
Lamar Hydraulic Pump Transfer Kits	
Fol-da-tank Storage Tanks	
AFFF and Purple K Re-Supply Kit	
Handheld Radio Communications Kit	
VOX Hazardous Atmosphere Communication System	
Scaffold Kit	
HC-320 Hydraulic Mainline Clamp	
Deflection Funnel Kits	
Bullet Hole Clamps	
Recovered Oil Metering System	
Hydraulic Mainline Team Clamp	
Flange Leak Clamps	
Pump-Around High Pressure Pumps	
48" High-Deck Transport Trailers	
Godwin 4" High Lift Pumps	

3.7 NON-MECHANICAL RESPONSE INFORMATION [18 AAC 75.425(e)(3)(G)]

3.7.1 In-Situ Bioremediation

Alyeska considers additions of nutrients as an important means of long-term remediation of oil spills. Fertilizer application can effectively enhance in-situ biodegradation of spilled oil under many circumstances. Fertilization is a standard practice and can be applied frequently. Several products and methods have been used to remediate weathered crude oil in Alaska and other states. In addition, the Environmental Protection Agency's (EPA's) Bioremediation Action Committee recommended bioremediation as a cleanup technique under specific conditions, including the addition of nutrients to oil contaminated cold water beaches in its *Interim Guidelines for Preparing Bioremediation Spill Response Plans* in 1991.

3.7.1.1 Terrestrial Sites

On upland sites where some natural recovery is evident, agricultural fertilizers alone or fertilization with some scarification and seeding of bare areas may be all that is necessary. On more heavily contaminated sites, tilling may be useful with the fertilizer application. Repeating the fertilizing and tilling may be necessary until the oil concentration is reduced.

In the first growing season following the oil spill, fertilization is the minimum treatment. In subsequent years, the results of revegetation are assessed before further treatment, especially treatment that disturbs the ground surface. If subsequent growing seasons show recovery, treatments other than fertilization are generally halted. In general, in-situ bioremediation at oil spill sites along the pipeline involve fertilization in late spring through early summer.

Promoting regrowth of vegetation helps prevent degradation of permafrost and subsequent soil erosion. Seedlings can succeed in soils having up to 7% oil content in many circumstances, a conclusion based on several bioremediation studies, including monitoring of land-farmed oil sludge at the Valdez Marine Terminal.

3.7.1.2 Shoreline Sites

Water solutions of agricultural fertilizers, pellets of slow-release fertilizers, and mixtures of fertilizer with surface-adhering agents are the chief means of application on shorelines. The EPA Office of Technology Assessment concluded that a number of tests showed that bioremediation increased chemical degradation rates of the oil at sites in Alaska and elsewhere.

Although fertilization clearly enhances microbial degradation of oil, statistically significant physical losses of the oil due to fertilization are more difficult to demonstrate. Many studies by the EPA and others have not shown statistically significant effects of most fertilization treatments on gravimetric measures of residual oil. The distribution of the oil in the substrate and the natural processes that remove the oil are so highly variable that they mask even large effects of the fertilizer under most test circumstances.

The clearest indications of losses of oil, measured by grab samples of substrate, come from large studies in Alaska. For example, a field study by the EPA in 1989 showed that sprayed water solutions of nitrogen and phosphorus were associated with statistically significant decreases in measures of oil residue on cobble beaches over six weeks. In addition, the effectiveness of bioremediation in removing oil,

independently of physical processes, was strongly indicated by sharp declines in the ratio of degradable oil compounds to hopanc (a hard to degrade constituent of oil) in a paper by James R. Bragg, “Monitoring Rates of Bioremediation From Changes in Oil Chemistry,” sponsored by Exxon, presented at the EPA Region VI Response Team’s Oil Spill Bioremediation Seminar in 1992.

The effectiveness of fertilization for in-situ bioremediation of oil spills, based on reviews of many field studies, is outlined in *REF-PWS-TP-2012*, *Prince William Sound Tanker Oil Discharge Prevention and Contingency Plan*, Part 3, Supplemental Information Document #17, “Bioremediation,” a joint agency and industry report.

3.7.1.3 Environmental Consequences

The bioremediation approval process is the specific mechanism in place to assess the environmental consequences of this non-mechanical response option. In the event of a spill, trustee agency representatives are part of the Incident Management Team and work directly with Alyeska personnel to ensure that environmental consequences of bioremediation are considered.

3.7.1.4 Inventory of Non-Mechanical Response Equipment

In-situ bioremediation does not require any unique equipment. Standard equipment such as rototillers and fertilizer applicators are readily available.

3.7.1.5 Identification of All Necessary Approvals

Prior to using a bioremediation product, approval is required from the Alaska Regional Response Team (ARRT). Normally, only those bioremediation products that are listed on the National Contingency Plan (NCP) Product Schedule may be used. The Federal On Scene Coordinator (FOSC) may authorize use of a product (whether or not it is on the NCP Product Schedule), if in his/her judgment, use of the product is necessary to prevent or substantially reduce a hazard to human life.

3.7.1.6 Identification of All Permits, Approvals, or Authorizations for Use of Non-Mechanical Response Techniques

See Section 3.7.1.5.

3.7.1.7 Plan for Protecting Environmentally Sensitive Areas

A decision may be made to use in-situ bioremediation to minimize environmental damage overall and safeguard public health or property. Effects of runoff and drainage will be considered when planning for an in-situ bioremediation response option. Alyeska will rely on the site-specific plans found in Volumes 3 and 4 of this document. In addition, response personnel will use EA-119, *Environmental Atlas of the Trans Alaska Pipeline System*, as a source of supplemental information.

3.7.2 In Situ Burning

Oil spill removal during the shoulder seasons can be greatly enhanced by in-situ burning. Cold water and ice provide containment and slow the weathering process, thereby concentrating the oil for burning and

recovery. In-situ burning in shoulder season ice conditions generally involves selective burning of oil on melt pools and in leads between floes, followed by manual recovery of residue.

The consensus of research on spill response in broken ice conditions is that in-situ burning is an effective response technique with removal rates exceeding 85 percent in many situations (Shell et al. 1983, SL Ross 1983, SL Ross and DF Dickins 1987, Singsaas et al. 1994, SL Ross et al. 1998, DF Dickins et al. 2000, Sørstrøm et al. 2010).

3.7.2.1 Environmental Consequences

The environmental consequences of in-situ burning will be assessed by monitoring the downwind trajectory of the smoke. A trial burn will be conducted to determine the path of the smoke.

Appropriate measures as required by the Unified Command, natural resource agencies, and public safety agencies will be carried out to protect nearby human populations and environmentally sensitive areas. In-situ burns will be limited to sites that are a minimum safe distance, generally several miles upwind of human populations. The safe distance will be plotted as outlined in the "In Situ Burning Guidelines for Alaska, Revision 1" (ADEC, EPA, USCG, 2008). The determination takes into account a trial burn, wind conditions, and size of the expected burn area. The safe distance guidelines are based on the predictions of a National Institute of Standards and Technology ALOFT-Flat Terrain computer model. In addition, public notifications and warnings will be issued in cooperation with agency emergency staff.

3.7.2.2 Inventory of Non-Mechanical Response Equipment

For non-mechanical response, Alyeska maintains an inventory of fire-resistant boom and the Helitorch listed in Table 3-7, "Oil Spill Equipment – Location Assignments." The Helitorch is held in warm storage, inventoried, and the gelling agent is stored properly. The unit is maintained in a ready state for response. In addition, Alyeska has access to the ACS burning equipment presented in Table 3-24.

TABLE 3-24 BURNING EQUIPMENT

Equipment	Quantity
Helitorch	8
Helitorch Surefire gel	1,200 pounds
Air deployable igniters	1,480
Helitorch batch gel mixers	2

Adapted from ACS inventory – Response Equipment Specifications, ACS *Technical Manual*, Tactic L-6.

Helitorch training is administered to pipeline personnel through SERVS and Alaska Clean Seas (ACS). Classes include SERVS Basic Training (SRV/003) and the In-Situ Burning Class (OIS/079).

3.7.2.3 Identification of All Necessary Approvals, and a Completed Application for Open Burning

A discussion on permits, approvals, or authorizations for the use of in-situ burning is provided in Volume 1, Section 1.7.3.

3.7.2.4 Identification of All Permits, Approvals, or Authorizations for Use of Non-Mechanical Response Techniques

A discussion on permits, approvals, or authorizations for the use of in-situ burning is provided in Volume 1, Section 1.7.3.

3.7.2.5 Plan for Protecting Environmentally Sensitive Areas

To protect environmentally sensitive areas, areas of public concern, and the public from adverse effects of a burn, Alyeska's in-situ burn response will follow the ARRT "In Situ Burning Guidelines for Alaska" and any conditions attached to an approval to burn. Those guidelines, and Alyeska's actions, will provide for a safe minimum distance between the burn and human populations and provide for fire control mechanisms. Alyeska's plan for protecting environmentally sensitive areas from the in-situ burning operations (i.e., the non-mechanical response option) will include:

- Selection of the ignition method
- An estimation of the amount of oil to be burned
- Estimated duration of the burn (whether simultaneous or sequential burns were planned)
- Method for terminating the burn
- Means of collecting the burn residue
- Estimated trajectory of the smoke plume

In addition, Alyeska's burn plan will describe the equipment and safety gear available and the distance to the nearest human population.

To meet the ARRT's Guidelines and to protect specific areas, Alyeska will rely on the site-specific plans found in Volume 3. The site-specific plans are provided in the control actions and contingency area information tables. The aerial photographs and contingency area maps are found in the *Map Atlas.* In addition, response personnel would use *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*, as a source of current environmental information.

In situ burns conducted according to the Unified Plan are not expected to harm environmentally sensitive areas and areas of public concern. Heat from in situ burning affects only the upper few centimeters of the water column in contact with the oil. Smoke has not been found harmful to wildlife populations. In situ burning smoke is reduced to concentrations that are safe to people by means of burning only at safe distances.

3.8 PRIMARY RESPONSE CONTRACTOR INFORMATION [18 AAC 75.425(e)(3)(H)]

3.8.1 Response Action Contractors

Alyeska utilizes four response action contractors on TAPS.

- Alaska Clean Seas (ACS)
- Ahtna Construction & Primary Products Corporation
- TCC
- ASRC Energy Services – Houston Contracting Company, Inc. (HCC)

Specifics on each contractor are provided below.

3.8.1.1 Alaska Clean Seas (ACS)

ACS is an oil spill cooperative, of which Alyeska is a member. ACS maintains trained personnel, equipment, and supplies to respond to spills in the Arctic. ACS resources are immediately available to Alyeska, through assignment, for response to spills in Northern Region of the pipeline corridor. Outside of Northern Region, resources are available at the discretion of the ACS General Manager. ACS can be activated by calling the General Manager at the number listed in Table 3-25.

3.8.1.2 Ahtna Construction

Ahtna Construction & Primary Products Corporation is a primary response action contractor for Alyeska. The team is comprised of seven personnel based out of the Glennallen Response Base. The team consists of one Superintendent and two baseline crews (three personnel each) and is a combination of teamsters, operators, and laborers. Ahtna is required by contract to provide these two response teams on a 24-hour per day/7 days per week basis. The teams will be mobilized at the Glennallen Response Base. Alyeska is responsible to provide all necessary spill response equipment for Ahtna Construction to respond.

Ahtna Construction's primary area of coverage is primarily between (b) (7)(F), (b) (3) , but can respond to any location between Prudhoe Bay and Valdez, Alaska, as directed by Alyeska. Ahtna Construction can be activated by calling the number listed in Table 3-25.

3.8.1.3 TCC

TCC is a primary response action contractor for Alyeska, based out of Valdez, Alaska. TCC works as part of the SERVS Initial Response Team, described in further detail in Volume 1, Section 1.5.1. The team is comprised of eight personnel, made up of a combination of SERVS and TCC personnel available on a 24-hour per day basis.

The SERVS Initial Response Team's primary area of coverage is between the Valdez Marine Terminal and (b) (7) (F) but can respond to any location on the pipeline as directed by the Incident Commander. TCC can be activated by calling the number listed in Table 3-25.

3.8.1.4 ASRC Energy Services — Houston Contracting Company, Inc. (HCC)

ASRC Energy Services — Houston Contracting Company, Inc. is a primary response action contractor for Alyeska providing a baseline crew at each on-line pump station and at the Yukon, Fairbanks, and Delta Response bases. HCC also provides welding and pipe fitting personnel at the Alyeska Fabrication (Fab) Shop in Fairbanks as well as vehicle maintenance and equipment shop personnel. Oil spill response equipment is provided by Alyeska. Personnel are activated by calling the numbers listed in Table 3-25.

3.8.1.5 Statements of Contractual Terms

The statements of contractual terms for ACS, Ahtna Construction, TCC, and HCC are provided as Figures 3-7 through 3-10.

3.8.2 Mutual Aid Agreements

Alyeska has entered into Mutual Aid Agreements with three organizations along the TAPS corridor for the provision of resources in support of responding to an oil spill. The agreements along with their expiration date are summarized below.

Organization	Expiration Date	Services Provided
North Slope Operators	Open	Employees, personnel under contract, equipment, materials, and supplies
Alaska Department of Transportation (DOT) and Public Facilities, Northern Region	Open	Equipment and personnel
Naval SUPSALV	Open	Use and storage of airborne dispersants and delivery system for oil spill response

3.8.3 Contingency Agreements

Alyeska has entered into agreements with Rampart and Stevens Village to provide spill response support personnel and local knowledge regarding the Yukon River in the vicinity of [redacted]. Specific elements of local knowledge to be provided are the physical characteristics of the Yukon and operating safely on the river, as well as identification of environmentally sensitive and culturally important areas.

3.8.4 Other Resources

There are several oil spill response cooperatives within the State of Alaska, as well as cooperatives outside Alaska that can provide additional equipment and supplies, if required. The primary cooperatives within the State of Alaska are as follows:

- Cook Inlet Spill Prevention and Response, Inc. (CISPRI)
- Alaska Clean Seas (ACS)
- SEA-PRO
- Alaska Chadeaux

A complete list of contact names and numbers is provided in Alyeska's *Emergency Telephone Book.*

Statement of Contractual Terms

AS REQUIRED UNDER AS 46.04.30, AS 46.04.035, and 18 AAC 75.445(I)(1) in fulfillment of a requirement for registration of Primary Response Action Contractors and for approval of an Oil Discharge Prevention and Contingency Plan.

PLAN TITLE: **Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan**

PLAN HOLDER: **Alyeska Pipeline Service Company**

This statement is a certification to the Alaska Department of Environmental Conservation summarizing the contract between **Alyeska Pipeline Service Company** the oil discharge prevention and contingency plan holder (hereinafter "PLAN HOLDER") and **Alaska Clean Seas Cooperative,** the oil spill primary response action contractor or a holder of an approved oil discharge prevention and contingency plan under contract (hereinafter "CONTRACTOR"), executed **December 27,1993,** and an original of which is located at **Alaska Clean Seas, Spine Road, Prudhoe Bay, Alaska 99734-0022** as evidence of the PLAN HOLDER's access to the containment, control, and/or cleanup resources required under the standards at AS 46.04.030 and 18 AAC 75.495. The PLAN HOLDER and the CONTRACTOR attest to the Department that the provisions of this written contract clearly obligate the CONTRACTOR to:

(A) provide the response services and equipment listed for the CONTRACTOR in the contingency plan;
(B) respond if a discharge occurs;
(C) notify the PLAN HOLDER immediately if the CONTRACTOR cannot carry out the response actions specified in this contract or the contingency plan;
(D) give written notice at least 30 days before terminating this contract with the PLAN HOLDER;
(E) respond to a Department conducted discharge exercise required of the PLAN HOLDER; and
(F) continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the CONTRACTOR under the contingency plan.

I hereby certify that as a representative of the PLAN HOLDER, I have the authority to legally bind the PLAN HOLDER in this matter. I am aware that false statements, representations, or certifications may be punishable as a civil or criminal violation of the law.

WD Howitt — Signature
7/31/01 — Date

Name: **William D. Howitt**
Title: **Senior Vice President**
For: **Alyeska Pipeline Service Company – PLAN HOLDER**

I hereby certify that as a representative of the CONTRACTOR. I have the authority to legally bind the CONTRACTOR in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of the law.

Signature
8/21/01 — Date

Name: **James E. McHale**
Title: **General Manager**
For: **Alaska Clean Seas Cooperative - CONTRACTOR**

FIGURE 3-7 ALASKA CLEAN SEAS STATEMENT OF CONTRACTUAL TERMS

Statement of Contractual Terms

AS REQUIRED UNDER AS 46.04.30, AS 46.04.035, and 18 AAC 75.445(I)(1) in fulfillment of a requirement for registration of Primary Response Action Contractors and for approval of an Oil Discharge Prevention and Contingency Plan.

PLAN TITLE: **Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan**

PLAN HOLDER: **Alyeska Pipeline Service Company**

This statement is a certification to the Alaska Department of Environmental Conservation summarizing the contract between **Alyeska Pipeline Service Company** the oil discharge prevention and contingency plan holder (hereinafter "PLAN HOLDER") and **Ahtna Construction & Primary Products,** the oil spill primary response action contractor or a holder of an approved oil discharge prevention and contingency plan under contract (hereinafter "CONTRACTOR"), executed **October 10, 1996,** and an original of which is located at **Ahtna Construction & Primary Product's Offices, Glennallen, Alaska** as evidence of the PLAN HOLDER's access to the containment, control, and/or cleanup resources required under the standards at AS 46.04.030 and 18 AAC 75.495. The PLAN HOLDER and the CONTRACTOR attest to the Department that the provisions of this written contract clearly obligate the CONTRACTOR to:

(A) provide the response services and equipment listed for the CONTRACTOR in the contingency plan;
(B) respond if a discharge occurs;
(C) notify the PLAN HOLDER immediately if the CONTRACTOR cannot carry out the response actions specified in this contract or the contingency plan;
(D) give written notice at least 30 days before terminating this contract with the PLAN HOLDER;
(E) respond to a Department conducted discharge exercise required of the PLAN HOLDER; and
(F) continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the CONTRACTOR under the contingency plan.

I hereby certify that as a representative of the PLAN HOLDER, I have the authority to legally bind the PLAN HOLDER in this matter. I am aware that false statements, representations, or certifications may be punishable as a civil or criminal violation of the law.

W D Howitt — 7/31/01

Signature — Date

Name: **William D. Howitt**
Title: **Senior Vice President**
For: **Alyeska Pipeline Service Company – PLAN HOLDER**

I hereby certify that as a representative of the CONTRACTOR. I have the authority to legally bind the CONTRACTOR in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of the law.

9/10/01

Signature — Date

Name: **Dell Wilson**
Title: **President**
For: **Ahtna Construction & Primary Products - CONTRACTOR**

FIGURE 3-8 AHTNA CONSTRUCTION AND PRIMARY PRODUCTS STATEMENT OF CONTRACTUAL TERMS

Statement of Contractual Terms

AS REQUIRED UNDER AS 46.04.30, AS 46.04.035, and 18 AAC 75.445(I)(1) in fulfillment of a requirement for registration of Primary Response Action Contractors and for approval of an Oil Discharge Prevention and Contingency Plan.

PLAN TITLE: **Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan**

PLAN HOLDER: **Alyeska Pipeline Service Company**

This statement is a certification to the Alaska Department of Environmental Conservation summarizing the contract between **Alyeska Pipeline Service Company** the oil discharge prevention and contingency plan holder (hereinafter "PLAN HOLDER") and **TCC – A Joint Venture,** the oil spill primary response action contractor or a holder of an approved oil discharge prevention and contingency plan under contract (hereinafter "CONTRACTOR"), executed **September 16, 1997,** and an original of which is located at **200 South Harbor Drive, Valdez, Alaska 99686** as evidence of the PLAN HOLDER's access to the containment, control, and/or cleanup resources required under the standards at AS 46.04.030 and 18 AAC 75.495. The PLAN HOLDER and the CONTRACTOR attest to the Department that the provisions of this written contract clearly obligate the CONTRACTOR to:

(A) provide the response services and equipment listed for the CONTRACTOR in the contingency plan;
(B) respond if a discharge occurs;
(C) notify the PLAN HOLDER immediately if the CONTRACTOR cannot carry out the response actions specified in this contract or the contingency plan;
(D) give written notice at least 30 days before terminating this contract with the PLAN HOLDER;
(E) respond to a Department conducted discharge exercise required of the PLAN HOLDER; and
(F) continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the CONTRACTOR under the contingency plan.

I hereby certify that as a representative of the PLAN HOLDER, I have the authority to legally bind the PLAN HOLDER in this matter. I am aware that false statements, representations, or certifications may be punishable as a civil or criminal violation of the law.

W D Howitt — 7/31/01
Signature — Date

Name: **William D. Howitt**
Title: **Senior Vice President**
For: **Alyeska Pipeline Service Company – PLAN HOLDER**

I hereby certify that as a representative of the CONTRACTOR. I have the authority to legally bind the CONTRACTOR in this matter. I am aware that false statements, representations, or certifications may be punishable as civil or criminal violations of the law.

Gerald W McDonald — 8/3/01
Signature — Date

Name: **Gerald W. McDonald**
Title: **General Manager**
For: **TCC – A Joint Venture - CONTRACTOR**

FIGURE 3-9 TCC - A JOINT VENTURE STATEMENT OF CONTRACTUAL TERMS

Statement of Contractual Terms

AS REQUIRED UNDER AS 46.04.30, AS 46.04.035, and 18 AAC 75.445(I)(1) in fulfillment of a requirement for registration of Primary Response Action contractors and for approval of an Oil Discharge Prevention and Contingency Plan.

PLAN TITLE: **Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan**

PLAN HOLDER: **Alyeska Pipeline Service Company**

This statement is a certification to the Alaska Department of Environmental Conservation summarizing the contract between **Alyeska Pipeline Service Company**, the oil discharge prevention and contingency plan holder (hereinafter "PLAN HOLDER") and **ASRC Energy Services – Houston Contracting Company, Inc.**, the oil spill primary response action contractor or a holder of an approved oil discharge prevention and contingency plan under contract (hereinafter "CONTRACTOR"), executed January 13, 2010, and an original of which is located at both PLAN HOLDER and CONTRACTOR offices located in Fairbanks, Alaska as evidence of the PLAN HOLDER's access to the containment, control, and/or cleanup resources required under the standards at AS 46.04.030 and 18 AAC 75.495. The PLAN HOLDER and the CONTRACTOR attest to the Department that the provisions of this written contract clearly obligate the CONTRACTOR to:

A. Provide the response services and equipment listed for the CONTRACTOR in the contingency plan;
B. Respond if a discharge occurs;
C. Notify the PLAN HOLDER immediately if the CONTRACTOR cannot carry out the response actions specified in this contract or the contingency plan;
D. Give written notice at least 30 days before terminating this contract with the PLAN HOLDER;
E. Respond to a Department conducted discharge exercise required of the PLAN HOLDER; and
F. Continuously maintain in a state of readiness, in accordance with industry standards, the equipment and other spill response resources to be provided by the CONTRACTOR under the contingency plan.

I hereby certify that as a representative of the PLAN HOLDER, I have the authority to legally bind the PLAN HOLDER in this matter. I am aware that false statements, representations, or certifications may be punishable as a civil or criminal violation of the law.

Wes Willson — Signature
1/14/10 — Date

Name: **Wes Willson**
Title: **Emergency Preparedness and Compliance Manager**
For: **Alyeska Pipeline Service Company – PLAN HOLDER**

I hereby certify that as a representative of the CONTRACTOR, I have the authority to legally bind the CONTRACTOR in this matter. I am aware that false statements, representations, or certifications may be punishable as a civil or criminal violation of the law.

Wade B. Blasingame — Signature
1-14-10 — Date

Name: **Wade Blasingame**
Title: **President and General Manager**
For: **ASRC Energy Services – Houston Contracting Company, Inc. - CONTRACTOR**

FIGURE 3-10 HCC STATEMENT OF CONTRACTUAL TERMS

3.8.5 Additional Vendor and Support Contractor Information

To assist in spill prevention and response operations, Alyeska has entered into contracts, and continues to enter into further contracts, with vendors of response equipment and providers of response-related services. This section lists, by resource, contracts executed as of the date of the submission of this Plan (see Table 3-25). These agreements will change from time to time as they expire, or are terminated, and as other sources are located. As ongoing negotiations are completed and additional contracts are executed, this plan will be updated.

TABLE 3-25 VENDOR AND SUPPORT CONTRACTOR INFORMATION

Type of Service	Company Address	Contact Name	Contact Phone No.
AIRCRAFT SUPPORT			
ERA Aviation, Inc.	4700 Old International Airport Road, Anchorage, AK 99502	Steve Hill	(907) 266-8314
Bristow	1915 Donald Ave., Fairbanks, AK 99701	Rick Rogers	(907) 452-1197
Evergreen Helicopter	P.O. Box 578, Anchorage, AK 99501		(907) 276-2454
Northern Air Cargo	3900 Old International Airport Road, Anchorage, AK 99502	Mark Lilard	(907) 243-3331
Frontier Flying Services	5245 Airport Industrial Road, Anchorage, AK 99709		(907) 450-7250
Shared Services			(907) 263-3500
CAMPS AND FACILITIES			
Greater Prudhoe Bay Billeting	email: prudhoebilleting@bp.com	East Operating Area West Operating Area	(907) 659-5635 (907) 659-4415
City of Valdez Civic Center	P.O. Box 307, Valdez, AK 99686	Pam Lunt	(907) 835-4440
COMMUNICATIONS			
AT&T	629 E. Street, Anchorage, AK 99501	NOCC (24-7) Jerry Cates (work hours)	(907) 264-8414 (907) 264-4659
GCI Satellite	P.O. Box 99001, Anchorage, AK	NOC (24-hour line)	(907) 265-5561
Alaska Telecommunications	P.O. Box 110541, Anchorage, AK 99511	Phil Gerdes	(907) 267-4444 (907) 244-5340
Cellulink of Alaska	P.O. Box 64712, St. Paul, MN 55164-0712	Martin Stewart	(907) 267-4404
AT&T	356 Old Steese Highway, Fairbanks, AK 99701	Becky Cummings	(907) 459-2355
Copper Valley Telecom	P.O. Box 2529, Valdez, AK 99686-2529		(907) 835-8000
Copper Valley Telephone	P.O. Box 337, Valdez, AK 99686		(907) 835-2231 (907) 835-2231 (907) 835-2231
COMPUTER DATA RECOVERY			
Relo Information Management	1300 West 56th Ave., #14, Anchorage AK 99518	John Kaplan	(907) 563- 7014
CONSULTANT			
Spiltec	19220 NE 143rd Place, Woodinville, WA 98072	Alan A. Allen Fax	(425) 896-0988 (425) 869-7881 (Fax)
O'Brien's Response Management	6160 Carl Brady Drive, Anchorage, AK 99502-1801		(907) 550-8529
DISPERSANTS			
Lynden International	6441 South Airport, Anchorage, AK 99502	Jerry Stout (Cargo) Dennis Mitchell (Freight) Jeff Pennell (Freight)	(907) 249-4118 (907) 249-4107 (907) 249-4114

TABLE 3-25 (CONTINUED) VENDOR AND SUPPORT CONTRACTOR INFORMATION

Type of Service	Company Address	Contact Name	Contact Phone No.
DIVING CONTRACTORS			
American Marine Corporation	6000 A Street , Anchorage, AK 99518	Tom Ulrich	(907) 562-5420
ENVIRONMENTAL AND BIOLOGICAL CONSULTANTS			
SLR International Corp	22118 20th Ave. SE, Suite G202, Bothell, WA 98021	Lydia Miner	(425) 402-8800
Oasis Environmental, Inc.	825 W. 8th Ave., Anchorage, AK 99501	Office Brad Authier Max Schwenne	(907) 258-4880 (b) (6) (home) (b) (6) cell) cell)
EQUIPMENT MAINTENANCE			
AES Pipeline, Power and Communication	3900 C Street, Suite 602, Anchorage, AK 99503	Terry Howard (main line) Direct line Cell	(907) 339-6400 (907) 339-6424 (907) 830-8145
FOOD SERVICES			
Doyon/Universal	P.O. Box 102540, Anchorage, AK 99510-2540	Bob Kean	(907) 522-1300
NANA/Marriott	1001 E. Benson Blvd., Anchorage, AK 99508		(907) 223-2121
FUEL			
Crowley Marine	1102 SW Massachusetts Street, Seattle, WA 98134		(206) 332-8000
GROUND TRANSPORTATION			
Carlile Enterprises	900 Aurora Drive, Fairbanks, AK 99701	Lane Keator, Fairbanks Terminal Manager	(907) 451-7155
LABOR			
Ahtna Construction & Primary Products Corporation	P.O. Box 649, Glennallen, AK 99588	Sue Taylor	(907) 822-8717
Chugach Alaska Services, Inc. (CASI)	3501 Denali Street, Ste. 202, Anchorage, AK 99503	Cathy Allen	(907) 787-8851
CCI, Industrial	800 Cordova Street, Suite 102, Anchorage, AK99501		(907) 258-5755
CH2M HILL Engineering	301 W. Northern Lights Blvd., Anchorage, AK 99503	Charlie Wilson	(907) 762-1292
CH2M HILL Construction	301 W. Northern Lights Blvd., Anchorage, AK 99503	David Hopkinson	(907) 762-1265
Stevens Village	P.O. Box 74012, Stevens Village, AK 99774	Randy Mayo	(907) 452-7162
Rampart Village	P.O. Box 67029, Rampart Village, AK 99767	Ronnie Evans	(907) 750-4327
LAND-LEGAL/PERMITTING			
SLR International Corp	22118 20th Ave. SE, Suite G202, Bothell, WA 98021	Lydia Miner	(425) 402-8800

TABLE 3-25 (CONTINUED) VENDOR AND SUPPORT CONTRACTOR INFORMATION

Type of Service	Company Address	Contact Name	Contact Phone No.
MEDIA/PUBLIC RELATIONS			
Britch & Company	2454 Telequana Drive, Anchorage, AK 99517	Barbara Britch	(907) 248-2442
RESPONSE ACTION CONTRACTORS			
Ahtna Construction & Primary Products Corporation	P.O. Box 649, Glennallen, AK 99588	Sue Taylor	(907) 771-5307 (work) (b) (6) (cell
Alaska Clean Seas	Pouch 340020, Prudhoe Bay, AK 99734	Fred McAdams or Ron Hockings (6 p.m. to 6 a.m.)	(907) 659-3249, (907) 659-3202, or (907) 943-1861
ASRC Energy Services — Houston Contracting Company, Inc.	3900 C Street, Anchorage, AK 99503	Wade Blasingame	(907) 339-6412
Tatitlek Chenega Chugach, LLC (TCC)	200 S. Harbor Drive, Valdez, AK 99686	Peter Anderson, President, CASI Fred Berdahl, Project Manager, TCC	(907) 563-8866
SECURITY			
Doyon Universal Services	701 W. 8th Ave. Ste. 500, Anchorage, AK 99501	Bill Gause	(907) 522-1300
TESTING			
AM-Test Air Quality, Inc. (Horizon Engineering)	P.O. Box 525, 30545 S.E. 84th St., #5, Preston, WA 98050	Christina Bearden, David Bagwell	(425) 222-7746 (work) (503) 255-5050 (work)
TRAINING			
Prince William Sound Community College	P.O. Box 97, Valdez, AK 99686-0097		(907) 834-1640
UTILITIES			
The Water Works	P.O. Box 107, Glennallen, AK 99588-0107		(907) 822-4420 (907) 822-4205 Fax
WATER RESPONSE			
Crowley Marine	1102 SW Massachusetts Street, Seattle, WA 98134		(206) 332-8000
Valdez Fisheries	P.O. Box 125, Valdez, AK 99686	Ken Morgan Vicki Heisser	(907) 835-1329 (907) 835-4874
WATER ANALYSIS/MANAGEMENT			
SLR International Corp	2700 Gambell Street, Suite 200 Anchorage, AK 99503	Scott Rose	(907) 222-1112 (b) (6) (cell)
PSC Environmental Services	P.O. Box 84846, Seattle, WA 98124-6146		(907) 272-9007
Oasis Environmental, Inc.	825 W. 8th Ave,, Anchorage, AK 99501	Office Brad Authier Max Schwenne Dave Trudgen	(907) 258-4880 (b) (6) (home) (b) (6) cell) cell) cell)

3.9 OIL SPILL TRAINING AND EXERCISE PROGRAMS [18 AAC 75.425(e)(3)(I)]

The objective of the oil spill training and exercise programs is to train Alyeska and Contractor personnel to effectively respond to an oil spill in a safe and effective manner.

Training and instruction of personnel (including frequent response exercises) are carried out at the Fairbanks and Valdez offices, pump stations and response bases, and along the pipeline right-of-way. The objectives of these programs are to:

- Ensure that field-based oil spill response personnel are ready to handle oil spill emergencies.
- Inform Incident Management Team (IMT) members of their respective support duties and communications procedures.
- Ensure familiarity with the use of all equipment.
- Obtain data to suggest changes to the Plan in the light of information gained from the field exercises and actual experience.

Field exercises are held regularly to ensure overall readiness for response to large-scale oil spills and to verify that the plan and responding personnel are effective in mitigating damages from spilled oil. Prevention training is discussed in Volume 1, Section 2.1.1, “Prevention and Operations Training Programs.”

3.9.1 Training Program

The training program provides levels of proficiency that are identifiable to those individuals whose responsibilities would directly involve them in oil spill response. New Alyeska and contractor field employees in those positions are given a minimum of 36 hours of training during their first full year of employment. The required hours of training may be accomplished by any combination of classroom training, equipment familiarization, field training exercises, or in the response to actual spills. Training is conducted in accordance with Table 3-26. Each module (index) is discussed in Section 3.9.9, “Response Training Program.”

Proficiency is demonstrated through written tests or hands-on demonstration of proficiency that ensures the understanding of the assigned oil spill response role functions. The oil spill training and proficiency demonstrations are documented and records are maintained. Alyeska provides quarterly reports to ADEC documenting all Alyeska Response Action Contractor-required training. This includes direct training for the courses identified in Table 3-26, “OSCP Training Matrix,” as well as equivalent training provided by the contractors (Government Letter 24796, ADEC Approval Condition 4).

Only contractor or Alyeska personnel with training in the appropriate technical aspects of oil spill response will be assigned to Task Force Leader and higher positions in the management/supervision of the spill response. Other personnel may work under the direct supervision of lead personnel, as long as they meet the appropriate Hazardous Waste Emergency Response (HAZWOPER) requirements.

3.9.1.1 HAZWOPER Training Requirements

The level of HAZWOPER training needed by spill response personnel is dependent on the work that they will perform and what hazards are present when they perform the work. The work can be generally categorized as “defensive” and “offensive” actions and further defined by determining where the work will take place in relation to the “Hot,” “Warm,” or “Cold” zones.

Defensive actions are those actions to locate the spill, control the source of the spill away from the release area and spilled product, and initiate containment actions at a distance away from the immediate spill area. Offensive actions are those actions taken to control, contain, and clean up a spill in the area of the release. Personnel taking offensive actions would more than likely come into contact with the spilled oil when vapors are still present.

Generally, personnel working in oil spill response support functions, working at a distance from the spill location and with minimal chance of coming into direct contact with the spilled oil or vapors, would receive HAZWOPER Level 1 training. Examples of personnel in these roles are: pump station administrative assistant, catering manager and staff, planners, and engineers. Personnel working to contain and recover the spilled oil, who would have the potential for direct contact with the oil and vapors in proximity to the spill scene, would receive HAZWOPER Level 2 training. Examples of people filling these roles are security, safety, and environmental personnel.

Personnel working to control the source of the spill by application of temporary or permanent pipeline patching devices, who may come into direct contact with the crude oil and high vapor levels, will be trained to HAZWOPER Level 3. Examples of this group are the members of the Fairbanks Response Team, mechanics, baseline, and technicians.

Personnel working to direct spill response actions at the ICS On Scene commander level will have HAZWOPER Level 5 training. Examples of this group are Initial Incident Commanders and Operation Section Chiefs.

New employees or contractors with oil spill response job duties requiring initial HAZWOPER training are sent to levels 1, 2, 3, or 5 training, commensurate with their job duties during an oil spill. The Initial Pipeline Training Academy provides 40 hours of oil spill training to initial responders (Level 2 and above) and exceeds the OSHA 24-hour HAZMAT Technician Level (Level 3) and 8-hour First Responder Level (Level 2) requirements. Alyeska has reviewed the OSHA standards and ensured that the required components of each HAZWOPER training level are covered through the OSCP modules presented at the Initial PTA. This analysis is documented in Alyeska DOP *EPC-003, OSCP Hazwoper Requirement Review Process.*

The Refresher PTA consists of 16 hours and also exceeds the OSHA 8-hour first responder level (level 2) initial training requirements.

Initial Level 5 training is provided in addition to the Initial PTA for those roles requiring this training through an on-line training class.

OSHA training requirements for HAZWOPER also allow an employer to document that an individual has sufficient experience to objectively demonstrate competency for any of the HAZWOPER levels. Alyeska

may determine that an individual's experience (job function, participation in exercises or drills) adequately demonstrates competency for their HAZWOPER Level.

- Annual HAZWOPER refresher training, to maintain levels 2 through 4 certification, is provided through attendance at courses at the Refresher PTA. The OSHA requirement for refresher training is those employees shall receive annual refresher training of sufficient content and duration to maintain their competencies, or shall demonstrate competency in those areas at least yearly. Alyeska has reviewed this requirement an established in DOP *EPC-003* that the 16 hour Refresher PTA exceeds the OSHA requirement for all HAZWOPER Levels.

Level 5 refresher training is provided in addition to the Refresher PTA for those roles requiring this training through an on-line training class.

Level 1 refresher training is provided in a separate one-hour course. The application of HAZWOPER training requirements to oil spill response work is complex and dependent on the determination of all the hazards associated with the job. Clarification and guidance can be found in *SA-38, Alyeska Corporate Safety Manual,* or by contacting a Fire/Safety Industrial Hygiene (FSIH) Specialist.

3.9.1.2 Valdez Training Requirements

Valdez Marine Terminal (VMT) personnel (from the Oil Movements Team (OMT) and Maintenance Team) and SERVS Initial Response Team personnel are identified in Table 3-26 because of their role in response to incidents between Pump 12 and the VMT (MP 800). Terminal personnel are trained to conduct reconnaissance and to assist in initial response actions. The SERVS Initial Response Team, comprised of SERVS and TCC personnel, is trained to perform the initial containment and recovery actions that may be required during an incident. Terminal and SERVS Response Team personnel are trained in sufficient numbers to provide the teams identified in this plan.

3.9.1.3 Non-HAZWOPER-Trained Skilled Support Personnel

Per 29 CFR 1910.120(q)(4) *Skilled Support Personnel*, Personnel who are skilled in the operation of certain equipment, such as mechanized earth moving or digging equipment or crane and hoisting equipment, and who are needed temporarily to perform immediate emergency support, and who will be or may be exposed to the hazards at an emergency response scene, are not required to meet the HAZWOPER training requirements. However, these personnel shall be given an initial briefing at the site prior to their participation in any emergency response. The initial briefing shall include instruction in the wearing of appropriate personal protective equipment, what chemical hazards are involved, and what duties are to be performed.

Personnel who may be used in this category are in addition to the personnel and training requirements outlined in this plan and are not used to meet response planning standards.

3.9.1.4 Initial Training Requirements for Baseline Contractors

When a baseline crew at an affected response base has one or more new employees (employees without prior OSCP training), the new employees will at a minimum receive the following training within a 6-week (calendar weeks) period provided by a Qualified Instructor (typically the local P&CM or RBS):

Course ID	Title (PTA/007)
OSCP 03	Field Mechanics of ICS
OSCP 04P	Personnel Safety at Oil Spill site – P
OSCP 06P	P/L Communications System – P
OSCP 07P	Control Actions – P
OSCP 09P	Reconnaissance and Assessment – P
OSCP 10P[1]	Oil Spill Containment Booming – P
OSCP 11	Sorbents
OSCP 12P	Skimmers and Pumps – P
OSCP 16P	Tanks, Bladders, and Storage – P

[1] OSCP 10P will only be taught during the summer months. If a new employee is brought on during the winter season, the employee will receive OSCP 10P during the normal summer practical.

It is anticipated that the above training components can be taught within a one-day (8-hour) period.

3.9.2 Classroom Training

Classroom training will be used to train new employees, to retrain and update the skills of present employees, to train contractor personnel and, when appropriate, to introduce new methods, materials, and equipment. This training may be provided by classroom presentations, audio-video programs, online training, or by "one-on-one" instruction. Instruction will ensure that each individual is aware of their specific tasks and how the tasks relate to the overall oil spill response effort.

3.9.3 Equipment Familiarization

Field familiarization is conducted to train and update reconnaissance and response personnel with specialized oil spill equipment. This training may be provided by classroom and/or a field practical training session.

3.9.4 Field Training Sessions

Field training sessions are conducted to give hands-on training to reconnaissance and response personnel in their appropriate areas. Actual field deployment of reconnaissance and response equipment is included in these exercises.

Reconnaissance training sessions emphasize pipeline right-of-way (ROW) familiarization, containment site locations, access road locations, and specialized oil spill equipment familiarization. Response training sessions emphasize such things as:

- Field deployment problems
- Access problems in sensitive areas
- Variable environmental and weather conditions.
- Importance of quick response
- Selection of secondary containment sites
- Use and limitations of containment and recovery tactics and equipment

A post-training session critical review is conducted and improvement actions are taken and documented.

3.9.5 Response Exercise Program

Field exercises are conducted under the direction of the ROW Director. The exercises evaluate preparedness to react to an actual spill. The exercises permit evaluation of the training program. The requirements for the exercise will follow the National Preparedness for Response Exercise Program (NPREP). A listing of exercise types and definitions is found in Volume 1, Section 3.9.10, “Oil Spill Exercises.”

A debriefing is held, and a critique is written and reviewed after each exercise. The ROW Director is responsible for coordinating the exercise program and monitoring accomplishment of corrective actions.

The appropriate government regulatory agencies are invited to participate in the planning and execution of the response exercises.

Participation in periodic oil spill response exercises can be credited in lieu of refresher training. In order to take credit for participation in lieu of refresher training, an individual must do the following:

- have the individual’s performance witnessed and assessed by a higher level in the response organization, and
- complete a training roster.

3.9.6 General

The training program is kept updated and used for training new employees. Changes are made as a result of operational experience, technological advances, and changes in laws and regulations.

The training program includes an evaluation of the experiences gained during actual oil spills. This contributes to the overall development of Alyeska’s *CP-35, Trans Alaska Pipeline System, Pipeline Oil Discharge Prevention and Contingency Plan.*

3.9.7 Training Records Maintenance

See Section 2.1.1.2, “Maintenance of Training Records.”

3.9.8 ICS Training

Individuals who are designated to fill an Incident Management Team role at either the Emergency Operations Center facility or at the on-scene command level will be provided initial ICS training commensurate with their assigned position. This training will consist of both classroom lecture and practice exercises. Annual refresher training is provided and focuses to a greater degree on field-based activities, such as Operations, Planning, and Logistics.

Training can be tailored to the needs of the group and can be segmented and focused on the ICS elements listed below:

- Command and Command Staff
- Operations Section
- Planning Section
- Logistics Section
- Finance Section

On-going training credit is received by participation in oil spill exercises. Incident Management team members, at all levels of the structure, have opportunities throughout the year to improve their skills by working in their assigned roles during announced and unannounced exercises. At the end of each exercise, a self assessment is conducted at the staff, section, and unit levels. The post-exercise assessment results in action items that are assigned and tracked for completion and closure.

3.9.8.1 Initial Incident Commander Training

The Initial Incident Commander position may be filled by any P&CM, OC, RBS, MS, or Lead Technician as outlined in Table 3-26 and includes OSCP 24/Management of an Oil Spill Response. HAZWOPER Level 5 training, as outlined in Section 3.9.1, is also required for the Initial Incident Commander position.

3.9.8.2 Staging Area Manager Training

Staging Area Manager (STAM) positions are filled by Alyeska or contract logistical support personnel. Warehouse personnel are often tasked with this position because their daily duties are directly related to tasks required during a drill or event. Alyeska trains potential staging area managers by on-the-job experience during exercises or drills, or through a one-day class. Components of the training program include:

- Staging Area Manager Responsibilities
- Mobilization Considerations
- Mobile Command Post/IMT/STAM Relationship

- Organizing Staging Area Operations and Layout
- Ordering Support Needs
- Helicopter Operations & Sling Load Management
- Vessel Delivery Considerations
- Remote Food Delivery Considerations
- OSCP Response Trailer Types, Cargo, and Capabilities
- Radio Communications & Portable Repeaters
- OSCP Response Equipment Familiarization
- Decontamination Considerations
- Staging Area Site Checklist
- Demobilization

TABLE 3-26 OSCP TRAINING MATRIX

Index	Module/Course	B/L Mechanic	Fairbanks Extended Urban	Security	Clerical	B/L Crew	Maintenance Supervisor	P&CM OC RBS	Environment	Fire/Safety	Technician	Fairbanks Initial Response Team	Ahtna Construction Initial Response Team	SERVS Initial Response Team	Terminal OMT/ Maintenance Personnel	Incident Command & Operations Liaison*	Facility Engineer
01	Oil Spill Contingency Plan (OSCP) Introduction and Orientation	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC
02	Spill Prevention		YR			YR	YR	YR	YR		YR						YR
03	Field Mechanics of Incident Command System (ICS)	OC/YR	OC/YR	OC	OC/AP	OC/YR	OC/YR	OC/YR	OC	OC/YR	OC/YR	OC/YR	OC/YR	OC/YR	OC/YR	OC	
04	Personnel Safety at Oil Spill Site	OC/AP	OC/AP			OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP		
05	Pump Station Emergency Contingency Plans		YR	YR	YR	YR	YR	YR		YR	YR					YR	YR
06	Pipeline Communications System	OC/BP	OC/BP	OC	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	OC/BP	
07	Control Actions	OC/AP	OC/AP			OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP		OC	
08	Security	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC	OC		OC	
09	Reconnaissance and Assessment	OC/AP	OC/AP	OC/AP		OC/AP	OC/AP	OC/AP	OC	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC	
10	Oil Spill Containment Booming	OC/AP	OC/AP			OC/AP	OC	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP			
11	Sorbents	OC	OC			OC	OC	OC	OC	OC	OC	OC	OC	OC			
12	Skimmers and Pumps	OC/AP	OC/AP			OC/AP	OC	OC/AP	OC	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP			

TABLE 3-26 (CONTINUED) OSCP TRAINING MATRIX

Index	Module/Course	B/L Mechanic	Fairbanks Extended Urban	Security	Clerical	B/L Crew	Maintenance Supervisor	P&CM OC RBS	Environment	Fire/Safety	Technician	Fairbanks Initial Response Team	Ahtna Construction Initial Response Team	SERVS Initial Response Team	Terminal OMT/ Maintenance Personnel	Incident Command & Operations Liaison*	Facility Engineer
13	Helicopter Slinging*	OC/AP	OC/AP			OC/AP	OC	OC/AP	OC	OC/AP	OC/AP	OC/AP	OC/AP	OC/AP			
14	Boat Handling*	OC/AP				OC/AP	OC	OC/AP	OC	OC	OC/S/AP		OC/AP				
15	Mainline Valves	OC	OC/AP			OC/AP	OC	OC	OC	OC	OC/AP	OC/AP	OC/AP		AP		
16	Tanks, Bladders, and Storage	OC/AP	OC/AP			OC/AP	OC	OC	OC	OC	OC/AP	OC/AP	OC/AP	OC/AP			
17	Emergency Pipeline Maintenance and Repairs					**AP/BC		**AP/BC				**AP/BC					
18	Environmental Considerations	TC	TC	TC		TC	TC	TC	TC	TC	TC	TC	TC	TC			TC
19	Vacuum Units	OC/AP	OC/AP			OC/AP	OC	OC		OC	OC/AP	OC/AP	OC/AP	OC/AP			
22	Highway Tanker Spills	CY	CY			CY	CY	CY	CY	CY	CY	CY	CY	CY			
23	Fire Prevention	OC	OC	OC***		OC		OC	OC	OC	OC	OC	OC				
24	Management of an Oil Spill Response						OC/YR	OC/YR			OC/YR****					OC/YR	
25	Field Gas Detectors		OC/AP			OC/AP	OC	OC/AP		AP	OC/AP	OC	OC/AP	OC	PC		
57	Wildlife Hazing								TC								
N/A	HAZWOPER Level 1				OC/YR												
N/A	HAZWOPER Level 2			OC/YR			OC/YR		OC/YR	OC/YR					OC/YR		
N/A	HAZWOPER Level 3	OC/YR	OC/YR			OC/YR		OC/YR			OC/YR	OC/YR	OC/YR	OC/YR			
N/A	HAZWOPER Level 4									OC/YR							

TABLE 3-26 (CONTINUED) OSCP TRAINING MATRIX

Index	Module/Course	B/L Mechanic	Fairbanks Extended Urban	Security	Clerical	B/L Crew	Maintenance Supervisor	P&CM OC RBS	Environment	Fire/Safety	Technician	Fairbanks Initial Response Team	Ahtna Construction Initial Response Team	SERVS Initial Response Team	Terminal OMT/ Maintenance Personnel	Incident Command & Operations Liaison*	Facility Engineer
N/A	HAZWOPER Level 5						OC/YR	OC/YR			OC/YR****						
VEH/021		TC				TC		TC			TC/S	TC	TC	TC	TC		
VEH/023		OC				OC		OC			OC	OC	OC	OC	OC		

Note: ** The IC/OPS may be filled by any P&CM, OC, RBS, or MS who meet or exceed this level of training or designated individuals who, at a minimum, need this level of training.*
Note: *** Only Fairbanks Response Base Baseline P&CM, OC, and Initial Response Team members assigned to the Source Control & Repair Team are required to take O17P annually.*
Note: **** Security personnel receive FTP/051/061 to fulfill this requirement.*
Note: ***** Technicians who fill the role as Initial Incident Commander are required to take OSCP/24 and HAZWOPER Level 5.*
Note: *Responders who work in the Emergency Operations Center and the On-Scene-Command Center, whose duties are not included in this table, receive initial ICS and refresher training as listed in Section 3.9.8, "ICS Training."*

Key:

AP	Annual Practical	CY	Classroom Yearly	TC	Triennial Classroom
BC	Biennial Classroom	OC	One Time Classroom	PC	Performance Check
BP	Biennial Practical	S	Sufficient Number	YR	Yearly Review

3.9.9 Response Training Program

Module	Description	Objectives	Frequency
OSCP/01 - Introduction and Orientation	This module familiarizes personnel with the Alyeska Pipeline Oil Discharge Prevention and Contingency Plan, its concept, organization, spill reporting policies and procedures, and equipment availability and uses.	• Become familiar with and understand Alyeska's Pipeline Oil Discharge Prevention and Contingency Plan. • Understand how to conduct reconnaissance operations in your area. • Understand the initial response mobilization, strategies, and tactics. • Become familiar with reconnaissance and response equipment. • Understand reporting requirements and responsibilities.	One time classroom. This module will be the general subject training module.
OSCP/02 - Spill Prevention Control and Countermeasures (SPCC) Plan	This module familiarizes personnel with Alyeska's Oil Spill Prevention program. This training is intended to fulfill state and federal requirements for spill prevention training for facility operations and maintenance personnel. The subjects covered include descriptions of previous oil spills, containment and diversionary measures, and discussions of conformance with regulatory requirements (facility drainage, bu k storage tanks, facility transfer operations, tank truck loading/unloading, and facility inspection and record-keeping procedures).	• Describe the scope and purpose of the Spill Prevention Plan. • Identify the major oil spill potentials associated with a pump station and pipeline facilities. • Identify containment and diversionary systems. • Describe how we conform with regulatory requirements. • Understand the responsibilities involved in completing periodic inspections and PMs.	Annual Revision
OSCP/03 - Field Mechanics of Incident Command System (ICS)	This module is for personnel who may serve in the on-scene command organization. This module familiarizes or refreshes personnel with the basic Incident Command System and the on-scene command role in response operations, documentation, planning, situation updates, and resource ordering.	• Recognize that ICS is a management system that grows to meet the needs of an emergency. Understand why use of ICS terms is important. Understand the various levels of incident command. • Know how task force objectives (plan implementations) relate to overall achievement of strategies and objectives. • Know proper channels for ordering resources. • Understand proper use of appropriate ICS forms and status reporting.	One time classroom with a yearly refresher for members of the on-scene command and Initial Response Team (IRT).
OSCP/04 and OSCP/04P (Practical) - Personnel Safety at Oil Spill Site	This module is an overview of personnel safety. This module deals with two basic sections: the first is safety at spill site, the second is general response personnel safety. The second section also is used for annual practical training. The subjects include safety considerations, initial site assessment protocols, and precautions relative to land, water and air operations at a spill site, physical and chemical hazards, and familiarization with Material Safety Data Sheet, (MSDS). The personnel safety portion includes personal protective equipment (PPE)/ decontamination, benzene awareness, operation of gas detection equipment, hazard communication, noise, hearing, conservation, and respiratory protection and fit test.	Identify hazards pertaining to spill site safety. Be proficient in addressing personnel safety issues in the following areas: • PPE • Benzene • Hazard communication • Noise hearing conservation • Respiratory protection and fit test • Spill site safety assessment and hazard control • Demonstrate knowledge of MSDSs for crude oil, refined products, and other products transported by tank trucks. • Proficiency in operation of crude and refined oil product vapor detection equipment	One time classroom with annual practical for all pump station technicians, Maintenance Supervisor (MS), ROW/Civil Maintenance and Emergency Response Coordinators (P&CM), Oil Spill Coordinators (OC), baseline crew, Fire/Safety, Environment, and all members of the Initial Response Team (IRT).

3.9.9 Response Training Program (Continued)

Module	Description	Objectives	Frequency
OSCP/05 - Pump Station Emergency Contingency Action Plans	This module familiarizes personnel with the local pump station emergency action plan and organization to safeguard personnel and minimize property loss in the event of an emergency. The subjects covered include reportable emergencies, assigned responsible personnel and requirements, site-specific action responses and procedures, medical emergencies, emergency equipment, mutual aid, training, reports, and records.	• Understand the scope and purpose of the emergency contingency plans. • List the six "Reportable Emergencies." • Identify the local emergency organization and describe each member's responsibilities. • List flammable materials and protection methods associated with each on-site area. • Understand emergency notification procedures.	Yearly review for pump station personnel.
OSCP/06 and OSCP/06P (Practical) - Pipeline Communications Systems	This module familiarizes personnel with the proper operation of the VHF mobile radio system, and emergency response hand-held radios.	• Recognize proper radio protocol. • Demonstrate proper use of the Alyeska Radio-Telephone System (ARTS) - mobile radio equipment and hand-held radios.	One time classroom with biennial practical or a performance check.
OSCP/07 and OSCP/07P (Practical) - Control Actions	This module familiarizes personnel with the response strategies and tactics designed to halt the spread of oil on land or small streams, direct its movement, and minimize the area affected by a spill. The subjects covered are the variables of physical containment methods including seasonal limitations involving access, containment site selection, oil spill behavior and the basic techniques and implementation procedures for containment and exclusion at specific locations.	• Identify criteria for containment site selection. • List major stream characteristics. • Describe the control action variables. • Identify the seasonal considerations and the guidelines for control action applications. • List the available means of containment and exclusion in a given area. • Physically locate and identify roads, corrugated metal pipe (CMP), low-water crossings (LWCs), lakes, rivers, etc. • Describe the logistical requirements to construct berms and dams and deploy boom during summer and winter conditions.	One time classroom. Members of the Initial Response Team (IRT) will receive an annual practical or a performance check. This performance check will include group evaluation of previous events and discussion of any applicable changes and new technologies made since the previous training.
OSCP/08 - Security	This module familiarizes personnel with security's objectives, respons bilities, and duties during oil spill conditions. The subjects covered include an overall introduction, operations, assessment criteria, guard personnel duties, and conformance with security program requirements.	• Identify the four primary security policy objectives. • Describe the principal security responsibilities. • List the guidelines for assessing security problems.	One time classroom
OSCP/09 and OSCP/09P (Practical) - Reconnaissance and Assessment	This module familiarizes personnel with field reconnaissance materials, equipment, and the practical application of reporting during reconnaissance operations.	• Understand reconnaissance procedures. • Review and understand reconnaissance and assessment information contained in theODPCP. • Review and understand the applications and amendments to the relevant permits. • Be aware of special considerations regarding reconnaissance in certain areas. • Be able to gather and report assessment information required of persons performing oil spill reconnaissance.	One time classroom. Recon Team members will receive an annual practical evaluation or a performance check.

3.9.9 Response Training Program (Continued)

Module	Description	Objectives	Frequency
OSCP/10 and OSCP/10P (Practical) - Oil Spill Containment Booming	This module familiarizes personnel with the theory and practical operation of booms, deployed boom behavior, and boom deployment options. The subjects covered include boom types, uses, and applications. Deployment proficiency tasks involve placement techniques, anchoring methods, rope handling, and boom storage requirements.	• Know the various Alyeska boom types and their characteristics. • Identify stream characteristics and the effect of depth, currents, and debris on boom use. • Demonstrate the ability to deploy containment booms including placement techniques, anchoring methods, rope handling, and knot tying.	One time classroom. Members of the Initial Response Team (IRT) and other assigned personnel will receive an annual practical evaluation or a performance check.
OSCP/11 -Sorbents	This module familiarizes personnel with sorbent type by composition, the uses and limitations of each type of sorbent, and the transportation and disposal of used sorbent materials.	• Identify and describe the two general sorbent mechanisms. • Understand the three basic types of sorbents. List advantages, disadvantages, and provide examples of each. • Understand how sorbents are to be deployed. • Understand procedures for recovering and disposing of used sorbents.	One time classroom
OSCP/12 and OSCP/12P (Practical) - Skimmers and Pumps	This module familiarizes personnel with skimmer and pump types, capacities, applications, and practical operations including on-site power sources, attachments, maintenance, troubleshooting, and storage requirements.	• List and describe the operating principles of four basic skimmers in Alyeska's inventory. • List and describe the basic types of pumps and applications in Alyeska's inventory. • Demonstrate the ability to select, deploy and operate all skimmers and pumps in the response equipment inventory.	One time classroom. Members of the Initial Response Team (IRT) and other assigned personnel will receive an annual practical evaluation or a performance check.
OSCP/13P (Practical)- Helicopter Slinging	This module familiarizes personnel with the regulations, requirements, and safe procedures for receiving and attaching loads. The subjects covered include external loads, slings and tag lines, cargo hooks, and safety considerations.	• Describe the "safe" approach criteria for any helicopter. • Describe hand signals for helicopter. • Demonstrate the ability to load and sling oil spill materials.	One time classroom, with an annual practical. Members of the Initial Response Team (IRT) will receive an annual practical as a performance check.
OSCP/14 and OSCP/14P (Practical) - Boat Handling	This module familiarizes personnel with boats, and boating safety equipment and safe operating procedures. The subjects covered include general descriptions for Alyeska oil spill boats, Coast Guard approved equipment, navigation rules, pollution regulations, accident reporting, cargo loading, hypothermia, cold water drowning, and personnel safety.	• Understand boat and operator capabilities with regard to spill response. • Demonstrate safe boat handling operations.	One time classroom. Members of the Initial Response Team (IRT) assigned as boat operators will receive an annual practical evaluation or a performance check.
OSCP/15 and OSCP/15P (Practical) - Mainline Valves	This module familiarizes personnel with reference materials and documents that describe step-by-step procedures, safety measures, and tools for emergency operation of pipeline mainline valves. The subjects covered include mainline gate valves, check valves (CKV) and ball valves, and normal and emergency operating procedures.	• Describe the three types of mainline valves. • Describe three methods of actuating mainline valves. • Locate each remote gate valve (RGV), check valve (CKV), and manual gate valve (MGV) within your section. • Demonstrate knowledge of the use of a portable valve actuator for the emergency opening and closing of mainline valves.	One time classroom. Members of the Initial Response Team (IRT) assigned this role will receive an annual practical evaluation or a performance check.

3.9.9 Response Training Program (Continued)

Module	Description	Objectives	Frequency
OSCP/16P (Practical) - Tanks, Bladders, and Storage	This module familiarizes personnel with various types of recovered oil temporary storage containers available for spill recovery operations. The subjects covered include site selection criteria, assembly and installation procedures, maintenance and storage requirements.	• Discuss natural storage area options. • Be aware of seasonal effects on emergency storage device operation. • List the types of bladder and tanks in the OSCP inventory and their set-up procedures. • List the pros and cons of using bladders and tanks for emergency temporary storage. • Describe the decanting process.	One time classroom. Members of the Initial Response Team (IRT) assigned this role will receive an annual practical evaluation as a performance check.
OSCP/17 and OSCP/17P (Practical) - Emergency Pipeline Maintenance and Repairs	This module familiarizes assigned personnel with materials that describe procedures, safety measures, and equipment and tools for pipeline source control.	• Describe the tools and equipment available for temporary plugging and patching. • Describe procedure for assessing damage and equipment limitations. • Describe use of the equipment, site preparation requirements, and safety considerations associated with temporary plugging and patching.	Biennial classroom and practical training.
OSCP/18 - Environmental Considerations	This module familiarizes personnel with their periodic environmental inspection and reporting responsibilities, oil spill effects, oil spill cleanup concerns, restoration procedures, and internal communication procedures.	• Know environmental responsibilities as they apply to Alyeska and individual job procedures. • Understand oil spill effects on the environment. • Identify environmental effects of an oil spill cleanup. • Be familiar with spill site assessment and restoration procedures.	Triennial classroom
OSCP/19 Vacuum Units Considerations	This module familiarizes personnel with vacuum truck and vacuum skid equipment, routine maintenance, storage, and practical operating procedures. The subjects covered include equipment description, applications and capabilities, components, operating procedures, maintenance, and storage.	• Describe vacuum system capabilities and applications. • Identify and functionally describe the vacuum system components.	One time classroom with an annual practical evaluation or a performance check for assigned personnel.
OSCP/22 -Highway Tanker Spills	This module reviews regulations and familiarizes personnel with the equipment and methods used for responding to a spill of petroleum products or oil-field chemicals from a highway tanker.	• Explain Alyeska's oil spill policy regarding first, second, and third party tanker truck spills. • Describe the responsibilities of involved personnel. • Describe the safety procedures involving highway tanker spill response. • Be familiar with the different tanker types. • Demonstrate the appropriate use of equipment and containment techniques.	Yearly classroom
OSCP/23 - Oil Spill Fire Prevention Training	This module familiarizes personnel with fire prevention procedures and techniques associated with oil spill emergencies. The subjects include flammable material characteristics, liquid spills on water, land spills, and flammable vapor monitoring.	• Identify basic characteristics of flammable liquids. • Explain assessment considerations for handling flammable spills on water and land. • Describe precautions and possible vapor suppression actions.	One time classroom

3.9.9 Response Training Program (Continued)

Module	Description	Objectives	Frequency
OSCP/24 Management of an Oil Spill Response	This course is specifically for key response management personnel assigned to act in the following positions during an oil spill: Incident Commanders, On-Scene Commanders, and Operations Section Chiefs. **Prerequisites:** OSCP/02 Incident Command System Training	This course is designed to provide oil spill response management personnel with information and skills needed to: • Expeditiously establish command and control of the response to an oil spill • Assess and recognize the potential of the spill • Prioritize response actions based on safety, property, and environmental impacts • Establish the support systems needed to grow and sustain the response • Understand and work with outside agencies and other stakeholders • Be prepared for the evolutionary nature of an oil spill	One time classroom with yearly refresher
OSCP/025 Field Gas Detector	This course will provide TAPS employees with practical field experience and training in the use of portable gas detection equipment. The course will also enable the student to identify safe distances from an incident (cold/warm zone boundaries,) in order to carry out the initial response efforts, using available respiratory protection.	Upon completion of this activity, the student will: • Identify portable gas-testing equipment. • Apply gas-testing procedures. • Demonstrate correct use of the meter to take readings.	One time classroom with a performance check. Annual performance check for Safety Officers (Safety Generalists, P&CMs, Baseline Personnel, and Technicians).
OIS/057 - Wildlife Hazing	This module is specifically for personnel who would be designated to request hazing permits, supervise others in wildlife hazing, and conduct field operations.	• Become familiar with wildlife hazing permit application. • Become familiar with wildlife hazing techniques and equipment. • Become familiar with wildlife hazing logistical requirements.	Refresher classroom or field training every three years.
VEH/021 Alyeska Commercial Motor Vehicle Program and VEH/023 Commercial Motor Vehicle Truck and Trailer Practical	This course is designed for operators of commercial motor vehicles (CMVs). This course will review state, federal, and company regulations, rules, and policies governing safe operations of CMVs. The practical, VEH/023, trains and certifies Alyeska employees on truck and/or truck/trailer operations. **Equivalency:** An individual who possesses a CDL must provide a copy of the CDL to the trainer and then the trainer and trainee must sign the training roster. A copy of the CDL must be provided to the Occupational Health Unit. The individual can then receive credit for this course without taking the road test or passing inspection.	Operators of commercial motor vehicles will become familiar with: • The Federal Motor Carrier Safety Regulations as well as Alyeska's policies and procedures • Implementation of CMV regulations as stated in *OPS-002, Motor Vehicle Program for Alyeska Employees.* • Pre and post use inspections and safe vehicle operation • The finding of rules, policies, codes, and regulations • The impact of reckless driving, loss of license, and drug and alcohol use • Employment, medical, and driving record documentation maintenance. • Upon completion of the practical, participants should: • Demonstrate ability to inspect a vehicle • Demonstrate ability to operate a vehicle • Successfully complete inspection practical and road test	Triennial classroom and initial practical / performance check.

3.9.9 Response Training Program (Continued)

Module	Description	Objectives	Frequency
HAZWOPER Training	Before being assigned to a field position that includes oil spill response job duties, new employees or contractors are sent to levels 1, 2, 3, or 5 training, commensurate with their job duties during an oil spill. Annual HAZWOPER refresher training, to maintain levels 2 through 5 certification, is provided through attendance at courses at the Pipeline Refresher Training Academy. These courses are as follows: • Field Mechanics of ICS • Personnel Safety at the Oil Spill Site • Respiratory Protection Level 1 refresher training is provided in a separate one-hour course.	See Section 3.9.1, "Training Program," for HAZWOPER objectives.	Initial classroom and annual refresher.

3.9.10 Oil Spill Exercises

Alyeska will conduct periodic oil spill reconnaissance and response exercises under the direction of the ROW Director to ensure that adequate numbers of trained personnel and equipment are available to respond to oil spills at pump stations and along the right-of-way. Oil spill response scenarios will include multiple levels of spill volume from small spills up to catastrophic spill volumes, such as the Response Planning Standard volumes described in the Scenarios volume of the plan.

The design, execution, management, and documentation of lessons learned from these exercises will follow a programmatic approach based on the *National Preparedness for Response Exercise Program (NPREP) Guidelines*. The U.S. Coast Guard developed these guidelines, which have been adopted by the U.S. Environmental Protection Agency, the U.S. Department of Transportation, and the U.S. Department of Interior, Bureau of Safety and Environmental Enforcement.

A guiding principle of the exercise program is to conduct a sufficient number of exercises to ensure that all personnel have an opportunity to participate in at least one exercise, in their assigned response position per year. The ROW Director is responsible for development and management of the pipeline oil spill response exercise program. P&CMs and RBSs are responsible for scheduling, conducting, and making personnel available for participation in periodic exercises.

3.9.10.1 Exercise Design Process

Alyeska has adopted the federal standard, *National Preparedness for Response Exercise Program (NPREP) Guidelines.* Adoption and use of these guidelines for the development of a pipeline oil spill exercise program ensures that a consistent, objective, and programmatic methodology is used to develop, conduct, and evaluate oil spill exercises. The NPREP guidelines encourage a segmented approach based on response functions and contingency plan elements. This approach, which has been incorporated in the pipeline exercise program, provides a logical progression of initiating and growing a tiered response. The lowest level of activity for a response exercise will be one shift of workers at one pump station or response base building to the highest level of personnel and equipment from multiple sites directed by an agency-integrated Incident Management Team.

Plan elements to be exercised individually or in multiple combinations are:

a. notification
b. staff mobilization
c. unified command
d. response management system
e. discharge control
f. spill site assessment
g. containment
h. recovery
i. sensitive area protection
j. disposal
k. communications
l. transportation
m. personnel support
n. equipment maintenance and support
o. procurement
p. documentation

The objectives and scope of large exercises that incorporate a number of plan elements and response functions are developed by an exercise design team. An exercise design team is made up of company and federal, state, and local government personnel versed in oil spill response plans and processes. The design team's mission is to develop scenario and evaluation criteria that as realistically as possible test the response plan(s) and procedures that normally are implemented for an incident at a specific location. For smaller scale or internal exercises, the design team is normally made up of only company personnel.

Functions within the design team include exercise coordinator, exercise evaluation director, and exercise controllers. Depending on the complexity of the exercise, a single person may fill more than one design team function.

3.9.10.2 Exercise Evaluation Processes and Continuous Improvement

A post-exercise evaluation will be conducted after each exercise and summary notes will be made part of the exercise record. For small-scale exercises the P&CM and RBS will facilitate a critical self-assessment discussion among the participants. For large scale exercises involving personnel from multiple locations, the exercise evaluation director will staff a team of evaluators who will monitor and note the performance of each response group. The evaluation director will develop a summary report that includes observations from the evaluation team as well as the participants. Each participant is encouraged to provide examples of which elements went well during the exercise and which elements of the response could be improved. Significant items for improvement are documented, and actions to correct the deficiency are assigned and tracked to closure. These lessons learned are shared with other locations and teams. Each team is expected to follow through on closure in a timely manner.

3.9.10.3 Exercise Types, Scope, and Objectives

Internal Exercises

Internal exercises are those that are generated, designed, controlled, and graded by Alyeska and contractor personnel. Regulatory agency and community agency personnel are invited to participate and may contribute to the design, control, and grading of the exercise.

External Exercises

External exercises are those that are generated, designed, controlled, and graded by state or federal regulatory or community agency personnel. A variation of an external exercise is a mutual aid partner exercise that Alyeska or contractor personnel may attend as a responding unit and be controlled and graded as a participant in the exercise. The annual North Slope Mutual Aid Drill (MAD) is an example of this type of exercise.

Announced Exercises

Announced exercises are those exercises that the participants of the exercise know the day and time of the exercise, they may know the location of the exercise, and they may have a general idea of the exercise scenario.

Unannounced Exercises

These exercises are generated by a small design and control team made up of Alyeska, contractor, or regulatory agency personnel. The intended participants in the exercise are not allowed to know the time, day, area, or scenario of the exercise until the exercise is initiated. Once the exercise is initiated, the participants are given the spill location and other information they would need to adequately achieve the objectives of the exercise. Information is also provided to participants about what is not included in the exercise scenario or objectives.

Table Top Exercise

The term “Table Top Exercise” is used to describe a methodology of conducting and evaluating a response exercise. Table top exercises are used to evaluate the ability of the response organization to effectively implement pre-developed response plans and procedures. Participants are also evaluated on their ability to make strategic decisions and to adjust their tactics based on information inputs. Table top exercises normally do not include the actual deployment of response personnel and equipment. Exercise scenario information is provided to the responders and their actions are expected to be realistically simulated.

Table top exercises allow evaluators and responders to test portions of response plans and procedures usually restricted due to the potential for unacceptable business disruption, unnecessary environmental damage, or unavailable environmental conditions.

The objectives of table top exercises are developed as part of the exercise design process. Examples of objectives are command and control processes, logistics support, long-range cleanup/restoration, and repair planning.

Table top exercises can be announced or unannounced exercises and initiated as internal or external exercises.

Qualified Individual (QI) Notification Exercise

Designated Qualified Individuals will be contacted after normal business hours by telephone or cell phone to test the ability to notify them and their availability to respond. At least one QI is expected to be contacted within 15 minutes of the beginning of the exercise. At least one QI is expected to be able to report to the designated command center within 30 minutes of the notification. Actual travel to the command center is not required.

QI notification exercises are conducted as unannounced internal exercises.

Pipeline Emergency Procedures Exercise

The objective of these exercises is to evaluate the ability of the on-scene command personnel to initiate an organized response commensurate with the spill scenario. Participants in these exercises will normally include the initial response Incident Commander, the Safety Officer, the Security Officer, the Recording Secretary, the Situation/Resource Unit Liaison, the Operations Section Chief, and the Staging Area Manager. A representative number of Task Force Members may also participate.

Specific objectives of Emergency Procedures exercises include, but are not limited to,

- Quick establishment of the response organization,
- Establishment of incident objectives,
- Use and implementation or pre-developed response plans and checklists,
- Prioritization of response actions,
- Integration of government agency resources,
- Coordination of response actions with other affected parties, and a demonstration of an adequate level of overall command and control of the incident response, and
- Evacuation of uninvolved personnel or public who may be at risk.

These exercises can be internal or external, announced or unannounced exercises, and will normally be designed and controlled as a table top exercise.

Equipment Deployment Exercises

Equipment deployment exercises involve the actual deployment of response personnel and equipment to a simulated leak source on the pump station or along the pipeline right-of-way. The scope of equipment deployment exercises range from one task force-sized deployments originating from one pump station up to multiple task forces from multiple pump stations, an on-scene command group, and an Incident Management Team. Typical objectives of an equipment deployment exercise are:

- Notification and coordinated mobilization of responders and equipment,
- Establishment of incident objectives, strategies, and tactics that match the incident scenario and will minimize the environmental impact of a spill,
- Establishment of incident command, control, and communications that match incident response requirements, and
- Timely deployment of containment equipment to restrict the spread of oil,
- Timely deployment of oil recovery equipment,
- Coordination and prioritization of response personnel and equipment deployment, and
- Establishment of logistics support elements needed to sustain the response.
- The extent of the field activity is determined in the exercise design process. Equipment deployment exercises have limitations on some aspects of the activity.
- The pump stations or the pipeline are not shut down,
- No oil is actually released, although small amounts of spilled oil simulants are sometimes used,
- Cross-country travel off the pipeline right-of-way is restricted to prevent unnecessary damage to the terrain,
- Deployment of personnel and equipment is restricted to pre-permitted locations adjacent to the right-of-way and off right-of-way remote containment sites,

- Blockage of fish streams and rivers is limited and only allowable for short periods,
- Capture, harassment, or disruption of wildlife is prohibited, and
- Disruption of public use of rivers, streams, lands, and roadways is prohibited.

Equipment deployment exercises are conducted during all seasons of the year, in daylight and dark, can be internal or external exercises, and initiated as announced or unannounced exercises.

Reconnaissance Exercises

Reconnaissance (recon) exercise objectives are designed to test the ability of pump station/response base personnel to find, assess, report, and initiate source control actions for a spill from the pipeline. A recon exercise involves at least one recon team from one pump station/response base, and frequently involves multiple recon teams from multiple pump stations/response bases. Recon exercises are a type of equipment-deployment exercise using road vehicles and all-terrain tracked vehicles depending on the time of year and right-of-way travel conditions. Recon exercise methods of travel are restricted to the use of ground transportation equipment during all seasons of the year, during daylight and dark, and all typical weather conditions. While aircraft would be used in the event of an actual suspected leak, the use of aircraft in a recon exercise is restricted to ensure that ground recon capabilities are appropriately tested.

Typical objectives of a recon exercise are:

- Notification and coordinated mobilization of recon teams,
- Use of recon team instructions,
- Use of radio communications system to report locations and discovery information,
- Use of portable gas detectors to develop the initial spill site safety analysis, and
- Transport equipment operation.

Recon exercises can be internal or external exercises and initiated as an announced or unannounced exercise.

3.9.10.4 Exercise Records

Exercise packages will be retained per the Alyeska Records Retention Schedule, available on the A-Net, *AMS-016, Records Management Process*, and ADEC regulations.

The Senior Pipeline Compliance Coordinator provides a quarterly summary report to ADEC and the associated Joint Pipeline Office agencies. The ROW Department also maintains a summary annual calendar and schedule of oil spill exercises to be completed.

3.9.10.5 Exercise Schedule

The following exercises will be conducted by Alyeska in the 5-year NPREP exercise cycle:

- 20 Qualified Individual (Duty Officer-after hours) Notification Exercises
- 5 Pipeline Incident Management Team Exercises (one per year)
- 70 Pipeline Right-of-Way Reconnaissance (Recon) Exercises
- 70 Pipeline Right-of-Way Deployment Exercises (5 of which will be Source Control and Repair Exercises)
- 70 Pump Station Deployment Exercises
- 70 On-Scene Command Exercises

For the 2012 to 2016 C-Plan cycle 305 exercises are planned.

Note: The above exercises have been scheduled on a 5-year exercise calendar for each response base and have the following conditions:

- Fifteen (15) have been selected to be Combined Resource Exercises which are conducted with the participation of more than one Response Base. A minimum of three (3) will be conducted each year, evenly distributed to each of the regions.
- One (1) exercise per year per Response Base will be unannounced. These exercises are to be initiated by the P&CM or RBS.
- Different types of exercises may be conducted concurrently. That is to say, that Recon, Right of way Equipment Deployment, and On-Scene Command exercises may be part of the same scenario and be conducted on the same day. Individual exercise credit will be given for each type of exercise conducted.

3.9.10.6 Oil Spill Response Exercise Program Document

Oil Spill Response Exercise Program for the Trans Alaska Pipeline System January 1, 2012 to December 31, 2016, is Alyeska's summary document describing the TAPS oil spill response exercise program. It is also a supplementary information document (SID) for this C-Plan.

The document outlines Alyeska's regulatory obligations and the review and acceptance process for the exercise program and includes the following sections:

- Program Purpose
- Exercise Schedules
- Combine Resources Exercises
- Response Base Exercise Dates
- Program Procedures
- Form 10161, "Exercise Notification"

- Form 10250, “Exercise Documentation”
- NPREP Response Plan Components
- Training Documentation
- Exercise Documentation, Lessons Learned, & ROWMIS Procedures

3.10 PROTECTION OF ENVIRONMENTALLY SENSITIVE AREAS AND AREAS OF PUBLIC CONCERN [18 AAC 75.425(e)(3)(J)]

Containment instructions presented in Volume 3 provide detailed information on protection of environmentally sensitive areas along the length of TAPS.

3.11 ADDITIONAL INFORMATION [18 AAC 75.425(e)(3)(K)]

None

3.12 BIBLIOGRAPHY [18 AAC 75.425(e)(3)(L)]

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EC-71-05, Emergency Contingency Action Plan, Pump Station 5.

EC-71-YRB, Emergency Contingency Action Plan, Yukon Response Base.

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Section 4. Best Available Technology [18 AAC 75.425(e)(4)]

The best available technology (BAT) review, required by 18 AAC 75.425(e)(4), is presented in this section. The current or chosen technologies presented in this section are BAT at the time this plan is submitted for renewal per AS 46.04.030(e). Technologies (e.g., equipment, supplies, other resources, and related practices associated with using that technology) are discussed herein. Discussion is limited to technologies associated with the current operation of the Trans Alaska Pipeline System (TAPS) and best proven technology, or those technologies that have adequately been demonstrated as available for use by Alyeska for their intended purposes. For a crude oil transmission pipeline, a total of twelve areas require BAT review as delineated below.

- Applicable requirements of 18 AAC 75.425 (e)(4)(A)(i) for all contingency plans:
  - Communications [18 AAC 75.425(e)(1)(D)]
  - Source Control [18 AAC 75.425(e)(1)(F)(i)]
  - Trajectory Analysis [18 AAC 75.425(e)(I)(F)(iv)]
  - Wildlife Capture, Treatment, and Release [18 AAC 75.425(e)(1)(F)(xi)]
- Applicable requirements of 18 AAC 75.425(e)(4)(A)(ii) for terminals and crude oil transmission pipelines:
  - Oil Storage Tank Cathodic Protection [18 AAC 75.065(h)(2), (i)(3), or (j)(3)]
  - Leak Detection System for Oil Storage Tanks [18 AAC 75.065(i)(4) or (j)(4)]
  - Prevention and Control System for Existing Tanks [18 AAC 75.065(h)(1)(D)]
  - Means of Immediately Determining the Liquid Level of Bulk Storage Tanks [18 AAC 065(k)(3) and (4) or 18 AAC 75.066(g)(1)(C) and (D)]
  - Maintenance Practices for Metallic Piping Containing Oil [18 AAC 75.080(b)]
  - Protective Wrapping and Cathodic Protection [18 AAC 75.080(d), (k)(1), (l), or (m)]
  - Corrosion Surveys [18 AAC 75.080(k)(2)]
- Requirements of 18 AAC 75.425(e)(4)(A)(iv) for a crude oil transmission pipeline contingency plan:
  - Pipeline Leak Detection, Monitoring, and Operating Requirements [18 AAC 75.055(a)]

4.1 COMMUNICATIONS [18 AAC 75.425(e)(4)(A)(i)]

4.1.1 OSCP Field Communication [18 AAC 75.425(e)(1)(D)]

This section of the regulations deals with a description of field communications procedures, including, if applicable, assigned radio channels or frequencies and their intended use by response personnel.

Communications plans are discussed in Volume 1, Section 1.4.3, “Telecommunications Field Response.”

4.1.1.1 Determination of Chosen Technology

The portable communications system that Alyeska has in place for deployment anywhere on the pipeline is considered BAT.

4.1.1.2 BAT Review

Refer to Table 4-1.

TABLE 4-1 COMMUNICATIONS

BAT Evaluation Criteria	Selected Technology	Alternative Technology
DESCRIPTION	Use of communications procedures system in place for daily pipeline operations. See Volume 1, Section 1.4, "Communications," for a description of those procedures. A combination of portable base station radios and portable repeaters are deployed to meet the specific needs of the spill response beyond the resource available for routine operations. See Volume 1, Section 1.4.3, "Communications," for a description of those procedures.	Install fixed base station radios at each pump station, and install mountain top repeaters to provide coverage on the right-of-way (ROW). The same communication procedures would be used because Alyeska operations has limited flexibility to modify procedures without the change impacting response efficiency.
AVAILABILITY Whether technology is best in use in other similar situations or is available for use by applicant	Alyeska's current emergency radio system is technically one of the most advanced systems in Alaska and offers the highest ease of deployment	Available
TRANSFERABILITY Whether each technology is transferable to applicant's operations	No change	Could be transferred
EFFECTIVENESS Whether there is a reasonable expectation, each technology will provide increased spill prevention or other environmental benefits.	No change	A permanently installed emergency communication system would still require portable equipment that would have to be deployed at the time of the spill to provide adequate coverage for blind spots.
COST The cost to the applicant achieving BAT, including consideration of that cost relative to the remaining years of service of the technology in use by the applicant	No additional cost as system is deployed.	ROM $1.25 million capital outlay and an undefined cost for maintenance.
AGE AND CONDITION The age and condition of technology in use by the applicant	Current equipment was purchased within the last three years. All equipment is in excellent condition.	A fixed system technology is comparable in its development to portable systems.
COMPATIBILITY Whether each technology is compatible with existing operations and technologies in use by the applicant	The existing system is proven compatible.	A new system can be made to be compatible with the existing system.
FEASIBILITY The practical feasibility of each technology in terms of engineering and other operational aspects	Not applicable	Feasible, extremely costly, and not considered practical, since repeaters would have to be placed to cover the entire pipeline.
ENVIRONMENTAL IMPACTS Whether other environmental impacts of each technology, such as air, land, water pollution, and energy requirements, offsets any anticipated environmental benefits	No changes	Effects of placing the repeaters in a variety of environments that would be off right-of-way (construction) and maintenance.

4.2 EMERGENCY SOURCE CONTROL AND REPAIR PROCEDURES [18 AAC 75.425(e)(4)(A)(i)]

4.2.1 Source Control Procedures to Stop the Discharge and Prevent Further Spread [18 AAC 75.425 (e)(1)(F)(i)]

Alyeska maintains a highly trained Source Control and Repair Team (SC&RT) in Fairbanks for emergency source control and repair of a pipeline leak. Specialized tools and equipment have been modularly packaged and placed on trailers to allow for rapid response to TAPS locations. The SC&RT modular units, stored at the Fairbanks Response Base located on Nordale Road, provide the ability to contain a high hazard atmosphere crude oil leak utilizing the proper fire fighting, PPE, and clamping and repair equipment at the earliest possible time. The SC&RT is on-call 24/7 and maintains an annual training schedule. The SC&RT participates in a source control and repair exercise each calendar year. Equipment utilized by the SC&RT is described below.

4.2.1.1 Hydraulic Clamp 320 (HC-320)

Alyeska has designed specialized HC-320 clamps to contain a 1" 600 psi high pressure leak. The HC-320 is mounted on a Cat 320 hoe with a 24 foot boom and can be installed from the cab without exposing the operator to hazardous atmospheres. The HC-320 is capable of holding pressure at 600 psi or can open its valve to divert the crude release to storage through hoses or portable pipelines.

4.2.1.2 Deflection Funnels

Alyeska has designed aluminum lightweight deflection funnels to divert high pressure pipeline leaks into containment tanks. Unlike the HC-320, deflection funnels will not hold pressure. Deflection funnels simply contain and divert the leak into hoses, preventing misting and exposure of personnel to high lower explosive levels (LEL). Deflection funnels would be used if the HC-320 were delayed or multiple incidents required their application.

4.2.1.3 Transfer, Storage, and Metering System

Alyeska has designed its transfer and storage systems to be capable of handling the maximum volumes capable of being produced by its clamps and deflection funnels. The system is capable of transferring 400 gallons per minute at 200 psi from a high pressure leak to storage tanks and bladders. It can also meter and filter the exact quantity and percentage of oil and water mixtures delivered to vacuum and tanker trucks. Components of the system include:

- Lamor GTA-50 pump, trailer and power pack
- 4" Aluminum “Wil-Loc” portable pipeline
- 1300- and 3000-gallon transfer tanks
- 10,000-gallon portable bladders
- Meter and Filter Skid

4.2.1.4 Fire Protection, Decontamination, and PPE System

Site characterization and establishment of safety zones and proper PPE is the first step in a source control response. At the earliest possible time, SC&RT Safety Officers (SO) will establish hazard zones and PPE levels. Modular units have been designed to aid this process and include:

- Tri-max “Terminator” Fire Foam Skids
- 20' Decon and storage module
- SCBA and Aluminized Fire PPE
- Exclusion zone kit
- Insulation removal kit

4.2.1.5 Pump Around Skid

Alyeska maintains pump around skids to depressurize pipeline segments affected by a spill and to aid source control and repair activities. The skids are designed to operate under suction and discharge heads that may be encountered along the pipeline. All skids are lightweight and modularly designed for rapid deployment.

4.2.1.6 Bullet Hole Clamps

Alyeska maintains modified bullet hole clamps with its SC&R Team in Fairbanks. Modified bullet hole clamps are designed with a repair ring (donut) that allows direct welding of the donut and 6" weld-on cap to the mainline pipe to affect a permanent repair. Additional steel band bullet hole clamps are available with attached Buna-N, rubber, and aluminum cones which are screwed into the hole to provide a pressure tight seal. Bullet hole clamps are designed for low pressure leaks less than 150 psi.

4.2.1.7 Team Clamp

Alyeska maintains a 48" hydraulic team clamp in Fairbanks. The team clamp is applied from a 60-ton overhead crane directly to the mainline pipe. The team clamp is designed for moderate pressure leaks less than 300 psi. The team clamp would be used as a second-tier response following application of the HC-320 or for multiple leak events.

4.2.1.8 Flange Leak Clamps

Flange leak clamps are maintained in Fairbanks for all crude oil piping sizes. The system design consists of a bolted clamp ring, stainless steel sealing element at the joints, and a sealant that is injected into a cavity of the clamp to seal the leak within the stainless steel elements.

4.2.1.9 Buckle Sleeves

Buckle sleeves have been designed and fabricated by Alyeska for the purpose of encapsulating a buckle in the 48" mainline pipe. Buckle sleeves are maintained by Alyeska in Fairbanks.

4.2.1.10 Valve Bypass Piping

Leaks developing on mainline valve bypass piping can be controlled by closure of the isolation valves located on either side of the mainline valve.

A discussion on source control is provided in Volume 1, Section 1.6.1, “Procedures to Stop Discharge and Spread.” Source control procedures are also addressed in the twelve response scenarios located in Volume 2, “Scenarios.” These scenarios all involve the loss of oil from either the pipeline or a storage tank. The scenarios demonstrate source control and cleanup actions under a variety of weather conditions, product types, and receiving environments.

For the purposes of this BAT review, source control procedures are discussed from three sources: the pipeline, crude oil breakout tanks, and fuel storage tanks.

4.2.2 Selected BAT

See Volume 1, Section 1.6.1, for a detailed discussion of this technology. For a pipeline spill, there are no known, proven alternative technologies for source control other than using isolation valves and temporary patching/repair, which is considered BAT.

For a spill from a crude oil breakout tank, the present prevention and discharge limiting technologies in use on the pipeline include secondary containment and tank de-inventorying, which is considered BAT. 18 AAC 75.445(k)(2).

For a spill from a fuel storage tank, secondary containment and tank de-inventorying are considered BAT. 18 AAC 75.445(k)(2).

4.2.3 BAT Review

Refer to Table 4-2, Table 4-3, and Table 4-4.

TABLE 4-2 SOURCE CONTROL PROCEDURES FOR A LEAK – PIPELINE

BAT Evaluation Criteria	Current Method 1 Isolation Valves	Current Method 2 Temporary Patching/Repair	Current Method 3
DESCRIPTION	Discharge from the pipeline will be stopped by shutting in the pipeline using mainline valves on either side of the release point. See Volume 1, Section 1.6.1.	Repair leaking pipe with a temporary sleeve or clamp. This includes mechanical flange leak clamps, buckle sleeves, and bullet hole clamps	Hydraulically operated, 48" clamp.
AVAILABILITY	Presently in use on the pipeline. There are a total of 176 valves on the mainline.	Sleeves are stored at strategic locations on the pipeline and are ready for use at any time.	Newly acquired and constructed for 48" pipeline
TRANSFERABILITY	Presently in use on the mainline.	The technology is appropriate for pipelines.	Prototype
EFFECTIVENESS	Shut-in of the pipeline can be accomplished within 12 minutes or less after a leak has been identified. Closure time varies based on valve closure time. A number of the Alyeska mainline valves are presently in an indeterminate state regarding their complete sealing performance. These valves are being tested. Information on the valve testing program has been submitted to the Joint Pipeline Office (JPO).	A properly installed sleeve is the preferred method to repair damaged pipe and is 100% effective.	This clamp has been acquired by Alyeska and functional testing was completed in Summer, 2003. Additional testing and operator training was conducted in Summer 2004.
COST	Not applicable	Not applicable	Not applicable
AGE AND CONDITION	The majority of the valves were installed during construction of the pipeline and are 20 years old.	The majority of the clamps and sleeves are 20 years old. They are unused, in new condition.	New, prototype
COMPATIBILITY	Isolation valves are part of the original pipeline design and satisfy federal DOT requirements.	Placing sleeves on damaged or weak sections of pipe is compatible with pipeline operations.	Same as mechanical clamps
FEASIBILITY	No change	Sleeving of buried sections requires careful excavation around the pipe and may take several days to complete.	Same as mechanical clamps, will not work on buckle.
ENVIRONMENTAL IMPACTS	None	None	None

TABLE 4-3 SOURCE CONTROL PROCEDURES FOR A LEAK – CRUDE OIL TANK

BAT Evaluation Criteria	Current Method 1 De-inventory Tank/Secondary Containment	Current Method 2 Secondary Containment	Alternative Method
DESCRIPTION	Empty tank into another tank or the pipeline and any spilled oil held within secondary containment. Patch and seal if feasible.	Contain spilled oil inside a secondary containment area that satisfies the requirements of *18 AAC 75.075* for existing tanks. Patch and seal if feasible.	There are no known alternative methods of source control for an oil tank.
AVAILABILITY	The technology is best in use in US industry and is currently in use by TAPS.	The technology is best in use in US industry and is currently in use by TAPS.	
TRANSFERABILITY	Technology is already in place on the pipeline.	Technology is already in place on the pipeline.	
EFFECTIVENESS	This technology has proven highly effective in minimizing the spread of spilled oil from a tank leak.	This technology has proven highly effective in minimizing the spread of spilled oil from a tank leak.	
COST	Not applicable	Not applicable	
AGE AND CONDITION	The technology is both using the existing piping/tankage and using methods to operate that equipment. The equipment are not an age technology issue. The secondary containment has been reviewed and upgraded the last 5 years.	The technology is both using the existing piping/tankage and using methods to operate that equipment. The equipment is not an age technology issue. The secondary containment has been reviewed and upgraded the last 5 years.	
COMPATIBILITY	Technology is compatible with existing operations.	Technology is compatible with existing operations.	
FEASIBILITY	Technology is in place and operational on the pipeline.	Technology is in place and operational on the pipeline.	
ENVIRONMENTAL IMPACTS	None	None	

TABLE 4-4 SOURCE CONTROL PROCEDURES FOR A LEAK – FUEL STORAGE TANK

BAT Evaluation Criteria	Current Method Secondary Containment	Alternative Method De-Inventory Tank
DESCRIPTION	Contain spilled oil inside a secondary containment area that satisfies the requirements of *18 AAC 75.075* for existing tanks. Patch and seal if feasible.	Empty tank into another tank or the pipeline. Patch and seal if feasible.
AVAILABILITY	All oil storage tanks greater than 10,000 gallons are diked and sufficiently impermeable to prevent the migration of spilled oil.	Technology is in use for crude oil tanks on the pipeline.
TRANSFERABILITY	Technology is in place on the pipeline.	Transferable
EFFECTIVENESS	This technology has proven highly effective in minimizing the spread of spilled oil from a tank leak.	This is the only feasible method of stopping the discharge from a tank.
COST	Not applicable	Cost will be site-specific for each tank.
AGE AND CONDITION	24 years	24 years
COMPATIBILITY	Technology is compatible with existing operations.	Technology is compatible with existing operations.
FEASIBILITY	This technology is in place and operational on the pipeline.	Feasible, but the utility of doing so may not be practical for some tanks that are remotely located and there is no spare tankage to discharge into.
ENVIRONMENTAL IMPACTS	None	None

4.3 TRAJECTORY ANALYSIS [18 AAC 75.425(e)(4)(A)(i)]

4.3.1 Trajectory Analysis [18 AAC 75.425(e)(1)(F)(iv)]

This section of the regulations deals with “procedures and methods for real-time surveillance and tracking of discharged oil on open water and forecasting of its expected points of shoreline contact.” A discussion on surveillance and tracking is provided in Volume 1, Section 1.6.3, “Real-Time Surveillance and Tracking of Spill on Land and Water.”

4.3.2 Selected BAT

Visual observation and tracking of spilled oil on land and water has been proven effective over time and is the only methodology that provides timely and accurate results. Oil spill sensor technology has been developed and continues to be refined. The limitations of all oil spill sensors are that they can be defeated by environmental conditions such as temperature, fog, rain, snow, clouds, darkness, and terrain features. The development of sensor technology has focused almost exclusively on the detection of oil on water. This focus is based on practicality. Historically, more large oil spills occur in the marine environment. Oil spilled on water is much more dynamic in its movement and rate of spread than terrestrial spills, and oil on water provides a generally distinct signature which is easy for sensors to detect. All oil spill sensor systems need some level of image processing to take the digital input from the sensor and create a meaningful output in the form of a picture for use by the oil spill response organization. With even the most capable sensor system and near ideal sensing environment conditions, ground truthing or on-scene visual observation and confirmation of sensor imaging is required to prevent strategic and tactical errors in the oil spill response.

One sensor technology, which was initially developed for other uses that may have application for augmenting visual observations is infrared technology. This technology is commonly referred to as forward-looking infrared camera systems or FLIR. FLIR systems look for the differences in heat signatures emanating from the subject of interest and the background environment. Alyeska has a FLIR system that has been in use to conduct periodic aerial surveillances of the aboveground pipeline vertical support member (VSM) heat dissipation radiators. Alyeska’s contract helicopters are outfitted with external mountings to accept this system. The system is used during winter conditions, which provides the maximum heat signature differential between the dissipation radiators, ambient air temperature, and the snow-covered ground. Given the lack of opportunity to test the system on an oil spill, its actual performance is not confirmed.

4.3.3 BAT Review

Refer to Table 4-5.

TABLE 4-5 TRAJECTORY ANALYSIS

BAT Evaluation Criteria	Current Method 1 Visually	Current Method 2 Infrared Sensor (I/R)	Alternative Method 1 Satellite Remote Sensing Equipment	Alternative Method 2 Laser Fluorosensor	Alternative Method 2 Radar
DESCRIPTION	Use visual observations to track location and movement of oil. See Section 1.7.5.	I/R sensors detect the heat difference of spilled oil and ground or water.	Satellites are instrumented with a wide array of sensors that may be used to detect oil.	Oil exhibits fluorescent properties when exposed to ultraviolet light.	Oil on a sea surface dampens some of the small capillary waves. This dampening can be detected by radar as a possible oil spill.
AVAILABILITY	This is a commonly used methodology for the tracking and surveillance of spilled oil. Even in areas where other remote sensing systems are available for surveillance, visual observation is still used.	Alyeska owns a FLIR Safire II helicopter system that can read digital images. The system was purchased in 1999.	To the best knowledge of Alyeska, there is no system presently operational in the world that relies on satellite remote sensing to provide real-time tracking and surveillance of oil spills.	Still in developmental stage. Can differentiate between oil and "false positives" and in some situations is capable of detecting oil in ice and snow situations. Only known uses at this time are experimental involving government agencies.	Useful for searching large areas. Can be used at night and during bad weather.
TRANSFERABILITY	No change	The FLIR system is expected to detect a heat difference between spilled oil and background land or water temperatures.	Could be transferred once fully developed and operational. Primary utility would be restricted to large spills due to resolution problems.	Transferable, once the technology is refined and proven.	Transferable. This technology is presently in use in other parts of the world.
EFFECTIVENESS	No change	Effective in detecting recently spilled oil, especially under a snow layer.	Timing and frequency of overpasses by satellites, coupled with the need for clear skies to perform optical work, give a very low probability of seeing a spill on satellite data.	Still in development stage.	Relies on oil dampening of small capillary waves. Primary effectiveness on oceans/seas versus lakes and rivers. Additionally, identifies many false positives.

TABLE 4-5 (CONTINUED) TRAJECTORY ANALYSIS

BAT Evaluation Criteria	Current Method 1 Visually	Current Method 2 Infrared Sensor (I/R)	Alternative Method 1 Satellite Remote Sensing Equipment	Alternative Method 2 Laser Fluorosensor	Alternative Method 2 Radar
COST	O&M	$350k to acquire and $30k annual O&M.	ROM $1,000,000+	$500,000, not including a dedicated aircraft necessary to act as a platform to carry the laser Fluorosensor.	$2,000,000 to $4,000,000 and the need for a dedicated aircraft.
AGE AND CONDITION	Current practice has been in place for at least 20 years. Continues to be an excellent method of identifying and tracking oil.	The system was purchased in 1998 and in maintained to factory recommendations.	Not applicable	Not applicable	Not applicable
COMPATIBILITY	Not applicable	Compatible	Compatible	Compatible	Compatible
FEASIBILITY	Not applicable	Feasible to use in VFR flight conditions	Feasible but costly	Feasible but costly, particularly in light of the minimal use it would receive and the standby costs for a dedicated aircraft	This technology is not appropriate for a terrestrial pipeline. It is better suited for use in a marine environment.
ENVIRONMENTAL IMPACTS	None	None	None	None	None

4.4 WILDLIFE CAPTURE, TREATMENT, AND RELEASE [18 AAC 75.425(e)(4)(A)(i)]

4.4.1 Wildlife Capture, Treatment, and Release [18 AAC 75.425 (e)(1)(F)(xi)]

This section of the regulations deals with "plans for protection, recovery, disposal, rehabilitation, and release of potentially affected wildlife, including:

- Minimizing wildlife contamination through hazing or other means, when appropriate
- Recovery of oiled carcasses to preclude secondary contamination of scavengers
- Capture, cleaning, rehabilitation, and release of oiled wildlife when appropriate"

Wildlife response plans are discussed in Volume 1, Section 1.6.9, "Wildlife Response Plan."

4.4.2 Selected BAT

The present wildlife protection strategy in place on the pipeline is BAT. Alyeska has worked in concert with knowledgeable experts, such as the International Bird Rescue Research Center, and regulatory agencies, such as the U.S. Fish and Wildlife Service and the Alaska Department of Fish and Game, in the development of its Wildlife Plan. Alyeska also follows the Alaska Regional Response Team's (ARRT's) Wildlife Protection Guidelines for Alaska. The implementation of Alyeska's Wildlife Plan depends on the timely receipt of permits and approvals from state and federal agencies at the time of the spill event.

Technology associated with wildlife and oil spills is primarily related to the following areas:

- Information related to area populations – Information regarding the area populations of wildlife along the pipeline right-of-way is received primarily from state and federal agencies with wildlife management responsibilities. This information is supplemented with personal observations. Area population/range of movement is compiled in *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*, and this plan. No alternatives or better sources of information are known.
- Hazing practices and hardware – Hazing and hardware include audible alarms, passive techniques, and pyrotechnics and are in use based on advice from the U.S. Department of Agriculture, Animal Plant Health Inspection Services.
- Capture practices and hardware – Hardware for capture and transport includes nets and prefabricated cages. Alyeska knows of no alternatives or better devices available.
- Holding stabilization/cleaning practices and hardware – Alyeska maintains or has access to modular, special purpose units, designed to stabilize, clean, and promote recovery of oil contaminated birds and small mammals. The design of the modules and the capacity for the number of wildlife to be treated was established based on input and discussions from appropriate regulatory agencies and incorporated into the Wildlife Protection Guidelines for Alaska.

Release procedures and practices – Release procedures and practices are performed in consultation with the appropriate trustee agencies. Refer to Table 4-6 for BAT review.

TABLE 4-6 WILDLIFE CAPTURE, TREATMENT, AND RELEASE

BAT Evaluation Criteria	Current Method	Alternative Method
DESCRIPTION	Alyeska's Wildlife Plan was a joint cooperative effort between industry and regulators (trustee agencies) to develop an effective wildlife response infrastructure. The Wildlife Plan is based on many of the lessons learned from the Exxon Valdez oil spill. The technology is currently in use in veterinary medicine and also government animal damage control programs. See Volume 1, Section 1.6.9.	There are no known alternatives to the present program for wildlife capture, treatment, and release. (Personal communication - Mr. Kurt Clumpner, IBRRC, August 12, 1997)
AVAILABILITY	The Wildlife Plan is in place and available on the pipeline.	
TRANSFERABILITY	New practices and techniques related to wildlife hazing, capture, treatment, and release are primarily the result of lessons learned following actual oil spill events. Alyeska keeps itself apprised of the developments through attendance at seminars, industry contacts, and routine communications with state and federal wildlife management agencies. Viable practices and techniques are incorporated in pre-spill planning processes. In addition, Alyeska has contracts with oil spill responders, such as IBRRC, who travel the world for oil spill response. The contributions of the IBRRC staff add value to the Alyeska Wildlife Plan because IBRRC will review and update Alyeska's plan and training for latest technology and lessons learned from their oil spill responses.	
EFFECTIVENESS	The whole purpose of the Wildlife Plan is to minimize the impacts of a spill to wildlife by keeping them out of the oil and having a program in place to capture and rehabilitate any wildlife that does come in contact with oil. The effectiveness of the Wildlife Plan practices and techniques was recently demonstrated when portions of the wildlife response infrastructure, in place to support a spill from the pipeline, were activated at the request of the United States Coast Guard (USCG) to support a spill associated with the Selandang Ayu.	
COST	Judgments of costs, associated with an oil spill wildlife plan, normally are not a justification for a specific course of action due to established state and federal regulatory requirements and guidelines.	
AGE AND CONDITION	Tools, modular facilities, and associated durable supplies are in good working condition and stored in a manner to promote long life. Short shelf life consumable supplies are either purchased at the time of the incident or are monitored in storage for replacement prior to expiration of shelf life.	
COMPATIBILITY	Practices, techniques, hardware, and supplies associated with the Wildlife Plan are compatible.	
FEASIBILITY	The feasibility of the Wildlife Plan is based on compliance with water and federal wildlife management agencies and the ARRT's *Wildlife Protection Guidelines for Alaska* requirements. These requirements are periodically reviewed, in light of experience gained in actual spill events, and modified if needed.	
ENVIRONMENTAL IMPACTS	The Wildlife Plan itself does not have any environmental impacts beyond those necessary to collect and track wildlife.	

4.5 OIL STORAGE TANK CATHODIC PROTECTION [18 AAC 75.425(e)(4)(A)(ii)]

4.5.1 Oil Storage Tank Cathodic Protection or Corrosion Control [18 AAC 75.065(h)(2), (i)(3)]

This section of the regulations covers cathodic protection or another approved corrosion control system to protect tank bottoms from external corrosion where soil conditions warrant.

No new regulated oil storage tanks are planned for construction at this time.

Cathodic protection of existing tanks conforms to *API RP 651,* First Edition, 1991, per *18 AAC 75.065(h)(1)(B).* A full description of cathodic protection of oil storage tanks is found in Section 2.1.6.4.

The BAT analysis for existing tanks is found in Section 4.7.1.

4.6 LEAK DETECTION SYSTEM FOR OIL STORAGE TANKS [18 AAC 75.425(e)(4)(A)(ii)]

4.6.1 Leak Detection System for Oil Storage Tanks [18 AAC 75.065(i) or (j)(4)]

This section of the regulations deals with leak detection systems that allow observation from outside the tank to detect leaks in the bottom of the tank.

No new regulated oil storage tanks are planned for construction at this time.

The method of compliance, as allowed by *18 AAC 75.065(h)(1)(A)*, for leak detection for existing tanks (except 35-TK-157) is use of a sensitive gauging system where visual inspection is not possible (vertical tanks) and visual inspection for double-wall or elevated horizontal tanks. 35-TK-157 utilizes an under tank leak detection system in accordance with *18 AAC 75.065(j)(4)(A).* A full description of leak detection for oil storage tanks is found in Section 2.1.6.3.

The BAT analysis for existing tanks is found in Section 4.7.1.

4.7 PREVENTION AND CONTROL SYSTEM FOR EXISTING TANKS [18 AAC 75.425(e)(4)(A)(ii)]

4.7.1 Prevention and Control System for Existing Tanks [18 AAC 75.065(h)(1)(D)]

This section of the regulations deals with another leak detection or spill prevention system for existing tank installations.

Leak detection for tanks is discussed in Volume 1, Section 2.1.6, “Oil Tanks.”

4.7.1.1 Determination of Chosen Technology for Crude Oil Breakout Tanks

Alyeska meets or exceeds the requirements of 18 AAC 75.065 for existing installations. The requirements are met for the crude breakout tanks via the installation of tank bottom cathodic protection systems as required by 49 CFR 195.565.

4.7.1.2 Determination of Chosen Technology for Turbine Fuel and Small Fuel Tanks

Alyeska achieves compliance via 18 AAC 75.065(h)(1)(A), a sensitive gauging system. This is BAT. See 18 AAC 75.425(e)(4)(A)(ii).

Pump Station turbine fuel tanks are equipped with sensitive gauging systems described in Volume 1, Section 2.1.8, “Piping Corrosion Control and Leak Detection Program.” The gauging systems are Enraf Servo type gauges with a self-diagnostic function that alarms if the system fails. The level of accuracy for an Enraf gauge system is 1/1000 of a foot. The ENRAF tank gauge system will be used to conduct a monthly test of turbine fuel tanks. The test will be a 48 hour static tank test to measure product loss. Test procedures have been developed in accordance with the American Petroleum Institute (API) publication 323, “An Engineering Evaluation of Volumetric Methods of Leak Detection in Above Ground Storage Tanks,” and publication 325, “An Evaluation of Methodology for the Detection of Leaks in Above Ground Storage Tanks.”

A system (tank and gauge combined with external environmental influences on measurement accuracy and repeatability) sensitivity test was conducted on ten turbine fuel tanks in 1999. The system sensitivity for turbine fuel tanks is determined to be -96 gallons over a 48-hour period.

At this time, the following tanks remain in service:

- 31-TK-117
- 35-TK-157
- 37-TK-177
- 37-TK-178

Tank 157 is equipped with an under tank leak detection system designed in accordance with API Standard 650 Appendix I. The tank is retrofitted with five drain pipes that extend from the perimeter of the tank towards the center. Each drain pipe slopes slightly towards an external sump and monitoring riser, which can accommodate monthly monitoring from the exterior of the tank.

Other technologies such as tank double bottoms, tank bottom cathodic protection, thick film liner, or other systems were briefly considered but determined to be too costly, not well proven in the TAPS operating environment, or too disruptive for an existing installation. Horizontal aboveground small storage tank leak detection is provided by visual detection. These tanks are either double wall or elevated horizontal tanks, not in direct contact with the ground and set in lined secondary containments.

4.7.2 BAT Review

Refer to Table 4-7.

TABLE 4-7 SMALL HORIZONTAL ABOVEGROUND STORAGE TANKS

BAT Evaluation Criteria	Preferred Method	Alternate 1	Alternate 2
DESCRIPTION	Visual inspection of double wall space/secondary containment	Sensitive tank level gauges and meters	Leak sensors and alarms
AVAILABILITY	Currently in place	In place on some, but not all tanks	Available
TRANSFERABILITY	Transferable	Transferable	Not normally used in this application
EFFECTIVENESS	Procedurally controlled by daily area inspection	Gauge and meter error possible	Effective
COST	Not applicable - in use	$0-25,000 per tank	$0 - 50,000 per tank
AGE AND CONDITION	Original equipment in good condition	Original equipment in good operating condition	New
COMPATIBILITY	Compatible	Compatible	Not normally used in this application as direct visual detection is best
FEASIBILITY	In use	In use on some tanks	
ENVIRONMENTAL IMPACTS	None	None	None

4.8 TANK OVERFILL PROTECTION FOR BULK STORAGE TANKS [18 AAC 75.425(e)(4)(A)(ii)]

4.8.1 Tank Overfill Prevention for Oil Storage Tanks [18 AAC 065(k)(3) and (k)(4) or 18 AAC 75.066(g)(1)(C) and (D)]

This section of the regulation deals with having “a means of immediately determining the liquid level of bulk storage tanks” over 10,000 gallons and a means of notifying the operator of a high liquid level.

Overfill protection for tanks is discussed in Volume 1, Section 2.1.6, “Oil Tanks.”

4.8.2 Selected BAT

Currently, Alyeska’s crude oil breakout tanks and turbine fuel tanks are equipped with level gauges, and some tanks are equipped with high level alarms. The high level alarm sensors, where installed, are radio frequency (RF) type sensors that provide a signal to an alarm panel when it is immersed in oil. Alternate sensors were evaluated and are listed in Table 4-8.

The preferred method of compliance was chosen based on compatibility with existing systems, viable for both large and small tanks, demonstrated reliability in the TAPS operating environment and the ability to simply modify the systems to accommodate monthly or per-transfer testing.

This system has been installed on the crude oil breakout tanks, turbine fuel tanks, and small fuel or dispensing tanks greater than 10,000 gallons. On small tanks, local audible and visible alarms have been installed. The crude oil and turbine fuel tank audible and visible alarm annunciate at the Pump Station control room.

4.8.3 BAT Review

Refer to Table 4-8.

TABLE 4-8 TANK OVERFILL PREVENTION FOR BULK STORAGE TANKS

BAT Evaluation Criteria	Current Method	Alternative Method 1	Alternate Method 2	Alternative Method 3
DESCRIPTION	RF probe and switch mounted in external chamber with local status panel	Thermal level switch in an external chamber with local status panel	Vibrating tuning fork switch mounted in external chamber with local status panel	Float switch mounted in external chamber with local status panel
AVAILABILITY	Available	Available	Available	Available
TRANSFERABILITY	Used in industry	Transferable	Transferable	Widely used in industry
EFFECTIVENESS	Good reliability and fail-safe features	Very high reliability and excellent fail-safe features	High reliability and excellent fail-safe features	High reliability and excellent fail-safe features
COST	$600,000	Not costed	Not costed	Not costed
AGE AND CONDITION	Mature technology	Mature technology	Mature technology	Mature technology
COMPATIBILITY	Compatible with existing equipment	Compatible with existing equipment	Compatible with existing equipment	Compatible with existing equipment
FEASIBILITY	All work external to tanks and would be accomplished with minimal impact on operating facilities	All work external to tanks and would be accomplished with minimal impact on operating facilities	All work external to tanks and would be accomplished with minimal impact on operating facilities	All work external to tanks and would be accomplished with minimal impact on operating facilities
ENVIRONMENTAL IMPACTS	None	None	None	None

4.9 MAINTENANCE PRACTICES FOR METALLIC STEEL PIPING CONTAINING OIL [18 AAC 75.425(e)(4)(A)(ii)]

4.9.1 Maintenance Practices for Metallic Piping Containing Oil [18 AAC 75.080(b)]: Protective Wrapping or Coating and Cathodic Protection [18 AAC 75.080(d), (k)(1), (l), or (m)]

Metallic steel piping containing oil must be maintained in accordance with a corrosion control program approved by the department and for an existing installation must:

- Undergo a corrosion survey
- Be carefully examined for deterioration any time a section of buried line is exposed for any reason
- Undergo an additional examination and corrective action to repair the damaged pipe and control future corrosion if corrosion damage is found
- Be replaced with piping that meets the requirements of one of regulations for new installation, if feasible, when significant repairs or replacements are made

These requirements are found in Volume 1, Section 2.1.8.

4.9.2 Selected BAT

Maintenance practices for buried steel piping at Alyeska cover a multitude of individual activities, each utilizing BAT. The combination of these individual activities culminates in the implementation of the best available practices for maintaining the buried pipeline. The ultimate goal of all maintenance on buried pipelines is the preservation of the containment boundary for the oil being transported. Maintaining the thickness of the steel pipe wall and maintaining the foundation for the buried pipe are the two fundamental activities which preserve the containment boundary of the pipe. All of Alyeska's maintenance practices for buried pipe support these two fundamental activities.

Alyeska maintains the belowground pipe through the three-prong approach of prevention, monitoring, and maintenance/repair. This approach is applied to both the preservation of the pipe wall and the preservation of the pipe foundation. All TAPS crude oil piping complies with the construction and operating requirements of 49 CFR 195, which is the national standard for transportation of hazardous liquids by pipeline, and is BAT. The outline below shows the specific activities associated with this approach to pipeline maintenance. Table numbers indicate where the specific BAT review is presented.

4.9.2.1 Preventive Actions

- Preservation of Pipe Wall (Table 4-9)
  - *Cathodic Protection Systems* — The cathodic protection program system has been developed over several years involving extensive coordination with regulatory agencies and research of the state of the art. Both passive (magnesium anodes and magnesium ribbons) and active systems (deep well anodes and anode flex) are used.
  - *Protective Coatings* — Alyeska has had laboratory testing performed on several different types of coatings to identify the coating that was best in the unique application on the buried steel pipe. The maintenance coating selected is a high build epoxy with a silicon filter.

- *Corrosion Inhibitors* — Alyeska has selected corrosion inhibitors based on laboratory testing and monitored effectiveness in the Trans Alaska Pipeline System.

- Preservation of Pipe Foundation (Table 4-10)
  - *Soil Refrigeration/Stabilization* — Alyeska has installed refrigeration systems, as required, to protect the buried pipe in areas where the soils are thaw unstable and pipeline is buried. The type of refrigeration system selected depends upon the site-specific conditions. The two types used are mechanical active refrigeration and passive refrigeration.
  - *River Training Structures* — Alyeska installs river training structures, as required, to protect the buried pipeline from erosion of the foundation soils. These structures are designed for each specific site.
  - *Buried Pipe Insulation* — Alyeska utilizes one of two types of buried pipe insulation, annular and slurry box, based on the site conditions. The insulation types have been evaluated and selected for their thermal resistance properties in a fully saturated condition.

4.9.2.2 Monitoring (Table 4-11)

- *Ultrasonic Thickness Monitoring* — Alyeska utilizes ultrasonic thickness measurements to identify and monitor corrosion or wall loss. Information is collected in a database and analyzed to determine the re-inspection frequency.
- *Corrosion Pigs* — Alyeska utilizes both ultrasonic and magnetic flux pigs, along with multiple pig runs and a computer database, to evaluate the extent of corrosion on the pipeline and to monitor pipeline thickness. Alyeska also utilizes the corrosion pig database to evaluate the effectiveness of the pigs.
- *Cathodic Protection Monitoring* — Alyeska monitors the potential of the cathodic protection systems as required by the DOT. Practices have been developed to eliminate the influence of telluric currents when required. Close interval surveys are conducted with a 4-foot spacing between readings.
- *Cathodic Protection Coupon Monitoring (alternative is disconnecting cathodic protection to perform instant off check)* — Alyeska has installed coupon-monitoring stations along the pipeline to monitor the adequacy of the cathodic protection system. Interruption of the coupon with the mainline removes telluric current effects, mixed potential effects, and other I/R-drop effects from readings.

4.9.2.3 Foundation Monitoring (Table 4-12)

- *Curvature Pigs* — Alyeska utilizes curvature pigs to identify any areas of pipe movement. Multiple pig runs and survey data allow for monitoring of foundation stability.
- *Infrared Heat Pipe Survey* — Alyeska utilizes infrared cameras to survey the passive foundation refrigeration systems (heat pipes) to verify correct functionality.
- *Pipeline Surveillance* — Alyeska performs full pipeline surveillance by maintenance personnel weekly to identify any problems or potential problems with the buried pipe.

4.9.2.4 Maintenance

- Wall Thickness Preservation (Table 4-13)
  - *Remedial Anodes* — Alyeska installs remedial anodes where required and has developed practices that minimize the excavation required for these installations. Remedial anodes are used to maintain effective cathodic protection levels, and enhanced cathodic protection systems are used at select locations.
  - *Excavation and Recoating* — Alyeska evaluated excavation and recoating processes and determined that the most efficient cost-effective method is to utilize the corrosion pigs to identify specific areas for recoating. If possible, these areas are batched for efficiency.
  - *Sleeves and Mechanical Clamps, Structural and Pressure Containing* — Sleeves provide for economic repairs for pipe wall loss or damage when the damage is of a limited extent. The only alternative is pipe replacement.
  - *Pipe Replacement* — If an area of pipe suffers damage, Alyeska evaluates the best method for repair. Pipe replacement is sometimes an acceptable solution. The line must either be shut down or a line bypass must be installed before the replacement/repairs can occur.
- Foundation and Right-of-Way Maintenance (Table 4-14)
  - *Right-of-Way Maintenance* — Minimizes the potential for the failure of the foundation soils due to progressive environmental impacts, such as flooding, water ponding, etc.
  - *Heat Pipe Repair or Installation* — Alyeska monitors settlement of the pipeline. If settlement is identified in an area where passive refrigeration will stabilize the foundation, heat pipes are installed.
  - *Reinsulation and Releveling* — Alyeska monitors settlement of the pipeline. If settlement is identified in an area where it is determined that the pipe insulation is allowing excessive heat loss, then insulation may be installed, existing insulation may be repaired, the pipe may be reinsulated, and releveling of the pipe may be performed. In extreme cases the belowground pipe could be replaced with an aboveground configuration.

It should be noted that the BAT in many of Alyeska's maintenance practices are specific to the problem being addressed and the particular environment of the problem. For example, Alyeska utilizes several different types of cathodic protection for the pipeline. Each of these systems has been evaluated for the specific area of application. Where there is power available and soil conditions are conductive, impressed current systems are utilized. In other locations, various types of passive cathodic protection systems are installed. Alyeska evaluates the application of cathodic protection systems to determine the most cost-efficient method for providing the level of cathodic protection required. Many other maintenance practices have this site-specific nature which sometimes leads to the same problem being addressed in different ways.

The following BAT review provides a summary of Alyeska's maintenance practices in the evaluation areas as required by 18 AAC 75.080(b).

Where an alternative exists to Alyeska's practices, the alternative is contrasted with Alyeska's practice.

4.9.3 BAT Review

Refer to Table 4-9, Table 4-10, Table 4-11, Table 4-12, Table 4-13, and Table 4-14.

TABLE 4-9 MAINTENANCE PRACTICES FOR BURIED STEEL PIPING CONTAINING OIL (PREVENTIVE ACTIONS - PRESERVATION OF PIPE WALL)

BAT Evaluation Criteria	Current Method 1 Cathodic Protection Systems	Current Method 2 Protective Coatings	Current Method 3 Corrosion Inhibitors	Alternative Method
AVAILABILITY	Readily available and in use throughout several industries. Both passive (magnesium anodes and magnesium ribbons) and active systems (deep well anodes and anode flex) are used on TAPS.	Commercially available	Commercially available	There is no known alternative for preservation of pipe wall that is not significantly lesser technology.
TRANSFERABILITY	In use in several industrial applications	Transferable; however, Alyeska's coatings have been selected based on the unique applications on TAPS.	Transferable; however, inhibitors are designed for specific conditions and applications.	
EFFECTIVENESS	Highly effective on buried steel which is not electrically shielded	Highly effective	Highly effective	
COST	Alyeska invests several million dollars annually on cathodic protection system remediation and enhancement.	Justified economically for use on the TAPS buried oil pipe (other applications would require economic evaluation)	Justified economically for use in TAPS (other applications would require economic evaluation)	
AGE AND CONDITION	Technology is old, however, continually updated with respect to components to reduce cost and increase reliability	Technology is current with testing completed within the last seven years	Technology is current with continuing monitoring and adjustments as required	
COMPATIBILITY	Not applicable	Not applicable	Not applicable	
FEASIBILITY	In use in several industrial applications	In use in several industrial applications	In use in several industrial applications	
ENVIRONMENTAL IMPACTS	Passive systems have little or no environmental impacts. Impressed current systems impact the environment by way of the source of power generation.	Passive systems have little or no environmental impacts. Impressed current systems impact the environment by way of the source of power generation.	Environmental impacts are one of the criteria which must be evaluated in selection of a corrosion inhibitor.	

TABLE 4-10 MAINTENANCE PRACTICES FOR BURIED STEEL PIPING CONTAINING OIL (PREVENTIVE ACTIONS - PRESERVATION OF PIPE FOUNDATION)

BAT Evaluation Criteria	Current Method 1 Soil Refrigeration/Stabilization	Current Method 2 River Training Structures	Current Method 3 Buried Pipe Insulation	Alternative Method
AVAILABILITY	Commercially available	Site-specific design	Site-specific design	There is no known alternative for preservation of pipe foundation that is not significantly lesser technology.
TRANSFERABILITY	Transferable; however, limited to areas where the foundation soils are frozen and thaw unstable	Transferable	Transferable	
EFFECTIVENESS	Highly effective	Highly effective	Highly effective	
COST	Justified economically for use in TAPS. Other applications would require economic evaluation.	Site-specific	Site-specific	
AGE AND CONDITION	Active refrigeration is based on technology several decades old. Commercial passive refrigeration technology is newer but limited in application based on climate.	Current technology	Current technology	
COMPATIBILITY	Not applicable	Not applicable	Not applicable	
FEASIBILITY	Dependent on site conditions	Dependent on site	Dependent on site	
ENVIRONMENTAL IMPACTS	Active refrigeration systems utilize refrigerant gases, such as halogenated fluorocarbons (Freon). Passive systems utilize carbon dioxide or ammonia.	Dependent on site	Dependent on site	

TABLE 4-11 MAINTENANCE PRACTICES FOR BURIED STEEL PIPING CONTAINING OIL (MONITORING)

BAT Evaluation Criteria	Current Method 1 Ultrasonic Thickness Monitoring	Current Method 2 Corrosion Pigs	Current Method 3 Cathodic Protection Monitoring	Current Method 4 Cathodic Protection Coupon Monitoring	Alternative Method
AVAILABILITY	Commercial technology	Commercial technology upgraded to Alyeska specifications	Alyeska monitors the potential of the cathodic protection systems as required by the DOT. Practices have been developed to eliminate the influence of telluric currents when required. Close interval surveys are conducted with 4-footspacing between readings.	Commercial Technology	There are no known alternative technologies that are not significantly lesser technology.
TRANSFERABILITY	Transferable	Transferable; however, the development of the corrosion database requires the collection of data from multiple pig runs and actual data from field investigations	Transferable	Transferable	
EFFECTIVENESS	Highly effective	Highly effective	Effective	Effective	
COST	Services are available through inspection contractors. Costs depend upon the extent of the work required.	Depends upon the level of information required. Alyeska's costs for single pig runs have exceeded $4,000,000.	Technology is inexpensive. Costs depend upon interval spacing and length of line.	$40,000 per mile	
AGE AND CONDITION	Current technology	Current technology	Standard industry practice continuously updated through Professional Association (NACE)	Current Technology	
COMPATIBILITY	Not applicable	Not applicable	Not applicable	Not applicable	
FEASIBILITY	Requires excavation of buried piping for inspection	Dependent on site and piping configuration	Feasible	Feasible	
ENVIRONMENTAL IMPACTS	None	None	None	None	

TABLE 4-12 MAINTENANCE PRACTICES FOR BURIED STEEL PIPING CONTAINING OIL (FOUNDATION MONITORING)

BAT Evaluation Criteria	Current Method 1 Curvature Pigs	Current Method 2 Infrared Heat Pipe Survey	Current Method 3 Pipeline Surveillance	Alternative Method
AVAILABILITY	Commercial technology	Commercial technology	Available	There are no known alternative technologies that are not significantly lesser technology.
TRANSFERABILITY	Transferable	Limited to passive refrigeration stabilized foundations	Transferable	
EFFECTIVENESS	Effective	Effective	Effective	
COST	Multi-million dollar investment	Equipment is available. Costs are site-specific	Costs are site-specific	
AGE AND CONDITION	Current technology	Current technology	Current technology	
COMPATIBILITY	Not applicable	Not applicable	Not applicable	
FEASIBILITY	Dependent on natural stability of the pipe foundation and potential for detrimental pipe movement	Presently being worked on the pipeline	Presently being worked on the pipeline	
ENVIRONMENTAL IMPACTS	None	None	None	

TABLE 4-13 MAINTENANCE PRACTICES FOR BURIED STEEL PIPING CONTAINING OIL (WALL THICKNESS PRESERVATION)

BAT Evaluation Criteria	Current Method 1 Remedial Anodes	Current Method 2 Excavation and Recoating	Current Method 3 Sleeves and Mechanical Clamps, Structural and Pressure Containing	Current Method 4 Pipe Replacement
AVAILABILITY	Available	Available	Industry standard practice	Industry standard practice
TRANSFERABILITY	Transferable; however, installation practices require that the location of the buried pipe be known to within a few inches. Alyeska utilizes its as-built survey data and curvature pig data to provide this information.	Transferable; however, the economics are site-specific	Transferable	Transferable
EFFECTIVENESS	Effective	Effective	Effective	Effective
COST	Costs are site-specific	Costs are site-specific	Costs are site-specific	Costs are site-specific
AGE AND CONDITION	Current technology	Current technology	Current technology	Current technology
COMPATIBILITY	Not applicable	Not applicable	Not applicable	Not applicable
FEASIBILITY	Feasible	Continuous evacuation and recoating is not possible due to constrained thermal expansion on the TAPS belowground pipe.	Feasible	Feasible
ENVIRONMENTAL IMPACTS	None	Minimal due to application of epoxy-based coatings	None	None

TABLE 4-14 MAINTENANCE PRACTICES FOR BURIED STEEL PIPING CONTAINING OIL (FOUNDATION AND RIGHT-OF-WAY MAINTENANCE)

BAT Evaluation Criteria	Current Method 1 Right-of-Way Maintenance	Current Method 2 Heat Pipe Repair or Installation	Current Method 3 Reinsulation and Releveling	Current Method 4 Replacing Belowground Pipe With Aboveground Pipe
AVAILABILITY	Industry standard practice	Commercially available	Commercially available	Available
TRANSFERABILITY	Transferable	Site-specific application	Site-specific application	Site-specific application
EFFECTIVENESS	Effective	Effective	Effective	Effective
COST	Costs are site-specific	Costs are site-specific	Costs are site-specific	Costs are site-specific
AGE AND CONDITION	Current technology	Current technology	Current technology	Current technology
COMPATIBILITY	Not applicable	Not applicable	Not applicable	Not applicable
FEASIBILITY	Feasible	Site-specific application	Site-specific application	Site-specific application
ENVIRONMENTAL IMPACTS	None	Heat pipes utilize ammonia or carbon dioxide	None	None

4.10 CORROSION SURVEYS [18 AAC 75. 425(e)(4)(A)(ii)]

4.10.1 Corrosion Surveys for Crude Oil Piping [18 AAC 75.080(k)(2)]

This section of the regulations deals with an existing installation undergoing a corrosion survey.

4.10.1.1 Selected BAT

The Alyeska corrosion survey program meets the requirements prescribed by federal regulation, 49 CFR 195, which is a national program for pipelines and BAT. The Plan has been developed in close coordination with state and federal regulators. The existing method of corrosion survey is BAT. See Volume 1, Section 2.1.8, for a description of the program.

4.10.1.2 BAT Review

Refer to Table 4-15.

TABLE 4-15 CORROSION SURVEY

BAT Evaluation Criteria	Current Method	Alternative Method 1	Alternative Method 2
DESCRIPTION	DOT *49 CFR 195* requires a multiplicity of corrosion testing/monitoring which includes: • Bimonthly rectifier readings • Annual cathodic protection monitoring • Annual corrosion inspection • Internal corrosion coupon monitoring	Remote rectifier performance and test station monitoring Improved survey monitoring efficiency using data loggers	Use of external cathodic protection monitoring coupons where interference problems are noted
AVAILABILITY	All work is conducted in accordance with *MP-166*-series procedures.	Available	Available and used on the mainline
TRANSFERABILITY	Not applicable	Remote rectifier monitoring currently being installed.	Coupons used on mainline may be applicable in cases of unusual interference.
EFFECTIVENESS	Not applicable	Effectiveness generally equivalent to current system.	Increased effectiveness in cases of unusual interference
COST	Not applicable	Increased initial cost. Potentially reduced annual cost.	Approximately $10,000 per coupon
AGE AND CONDITION	20 years	Mature technology	Mature technology
COMPATIBILITY	Not applicable	Compatible pending information technology improvements	Compatible
FEASIBILITY	Feasible	Feasible	Feasible
ENVIRONMENTAL IMPACTS	None	None	Risk associated with excavation

4.11 FACILITY BURIED STEEL PIPING CONTAINING OIL [18 AAC 75.425(e)(4)(A)(ii)]

4.11.1 Corrosion Surveys for Non-Crude Oil Piping [18 AAC 75.080(k)(2)]

This section of the regulation deals with an existing installation undergoing a corrosion survey.

4.11.1.1 Determination of Chosen Technology

Alyeska's corrosion survey and monitoring programs have been performed and will continue to be performed in accordance with the most current edition of NACE (National Association of Corrosion Engineers) RP-0169, "Recommended Practices for Control of External Corrosion on Underground or Submerged Metallic Piping Systems." Inspection work will be performed by knowledgeable professionals trained in accordance with Alyeska's Quality Program. See Volume 1, Section 2.1.8, for a description of the program.

4.11.1.2 Selected Technology

A matrix comparison of alternatives to NACE SP-0169 recommended practices is presented in Table 4-16. A traditional this-or-that comparison is not generally applicable because NACE SP-0169 does not recommend one element over another. The standard does recommend a combination of techniques for corrosion monitoring and prevention.

Since corrosion is a site-specific phenomenon, there is no best survey technique that can be effectively used in every situation. For each specific site/situation, an appropriate corrosion survey method will be determined by qualified corrosion control personnel who can demonstrate that NACE SP-0169 objectives are satisfied. For Alyeska, qualified corrosion engineers will make the determination.

TABLE 4-16 FACILITY BURIED STEEL PIPING CONTAINING OIL

BAT Evaluation Criteria	Current Method	Alternative Method 1	Alternative Method 2	Alternative Method 3	Alternative Method 4	Alternative Method 5
External Corrosion Survey						
DESCRIPTION	Excavation w/ Inspection per NACE SP-0169	Remote Sensing NDE	Pipe to Soil Potentials	Corrosion Detection PIG	Close Interval Survey (CIS)	DC Voltage Gradient (DCVG)
AVAILABILITY	Available	Becoming available	Available	Not available for all pipe diameters	Available	Available
TRANSFERABILITY	Transferable	Probably transferable	Not transferable	Not transferable	Not transferable	Not transferable
EFFECTIVENESS	Effective	Not known	Not effective, buried fuel piping is insulated	Not effective	Not effective	Not effective
COST	Cost effective	Could be very cost effective	Not cost effective	Not applicable	Not cost effective	Not cost effective
AGE AND CONDITION	Current, accepted standard	New, not proven	Current	Not applicable	Current	Current
COMPATIBILITY	Compatible	Probably compatible	Compatible	Not compatible with mixed piping sizes	Compatible	Probably not compatible
FEASIBILITY	Feasible	May be feasible	Feasible	Not feasible	Feasible	Not feasible
ENVIRONMENTAL IMPACTS	None	None	None	None	None	None

TABLE 4-16 (CONTINUED) FACILITY BURIED STEEL PIPING CONTAINING OIL

BAT Evaluation Criteria	Current Method	Alternative Method 1	Alternative Method 2	Alternative Method 3	Alternative Method 4	Alternative Method 5
Internal Corrosion Survey						
DESCRIPTION	Excavation w/ UT Inspection per NACE SP 0106-2006	Internal Corrosion Coupons per NACE SP 0106-2006	Corrosion Detection Pig	Remote Sensing NDE	Pressure Drop Measurement	Sampling and Analysis
AVAILABILITY	Available	Available	Not available	Becoming available	Available	Available
TRANSFERABILITY	Transferable	Transferable	Not transferable	Probably transferable	Not transferable	Not transferable
EFFECTIVENESS	Effective	Effective	Not effective	Not known	Not effective	Not effective
COST	Cost effective	Cost effective	Not cost effective	Not known	Not cost effective	Not cost effective
AGE AND CONDITION	Current, accepted standard	Current, accepted standard	Not applicable	New	Not applicable	Not applicable
COMPATIBILITY	Compatible	Compatible	Not compatible/ mixed piping sizes	Compatible	Compatible	Compatible
FEASIBILITY	Feasible	Feasible	Not feasible	May be feasible	Not feasible	Not feasible
ENVIRONMENTAL IMPACTS	None	None	None	None	None	None

4.12 PIPELINE LEAK DETECTION, MONITORING, AND OPERATING REQUIREMENTS [18 AAC 75.425(e)(4)(A)(iv)]

4.12.1 Facility Buried Steel Piping Containing Non-Crude Oil [18 AAC 75.080(b)]

This section of the regulation deals with an existing installation corrosion control program.

4.12.1.1 Selected BAT

Alyeska's corrosion control program has been performed and will continue to be performed to satisfy the intents and objectives expressed in the most current edition of NACE SP-0169, "Recommended Practices for Control of External Corrosion on Underground or Submerged Metallic Piping Systems." Inspection work will be performed in accordance with Alyeska's *MP-166-series* procedures by knowledgeable professionals trained in accordance with Alyeska's Quality Assurance Program.

4.12.2 Crude Oil Pipeline Leak Detection, Monitoring, and Operating Requirements [18 AAC 75.055(a)]

This section of the regulations state that a crude oil transmission pipeline must be equipped with a leak detection system capable of promptly detecting a leak.

A discussion on the Trans Alaska Pipeline System (TAPS) crude oil leak detection program can be found in Section 2.1.8, "Piping Corrosion Control and Leak Detection Program."

4.12.2.1 Selected BAT

The transient volume balance system is BAT technology. The system is state of the art and was developed specifically for TAPS. This system has the capability of detecting leaks equal to or smaller than 1% of throughput with a 95% confidence level.

4.12.2.2 BAT Review

Refer to Table 4-17.

TABLE 4-17 PIPELINE LEAK DETECTION, MONITORING, AND OPERATING REQUIREMENTS

BAT Evaluation Criteria	Current Method 1 Line Volume Balance System	Current Method 2 Transient Volume Balance System	Current Method 3 Visual Identification	Alternative Method
AVAILABILITY	Uses accumulated volumes based primarily on custody transfer meters and measured tank volumes to calculate a line-wide leak rate for the pipeline. System is sensitive, allowing calculation of leaks down to very low rates, but suffers because it is relatively slow (detect times between 2.5 and 24 hours) and is weak at identifying the exact site of the loss from the pipeline system.	In 1990, two companies who specialize in automated pipeline leak detection systems were contracted to evaluate Alyeska's LVB leak detection system for possible improvement. SSI was chosen to develop and procure a transient state hydraulic model with slack line and DRA simulation, as well as leak detection on a segment basis. TVB is in use today. A rigorous performance review of the system is performed annually.	For the detection of small leaks below the threshold of the existing automatic systems, Alyeska has a visual observation program in place. This includes aerial surveillance of the pipeline on a regularly scheduled basis, as well as a reporting mechanism for the general public to report any spills they might notice.	Alyeska is currently working with Energy Systems International (ESI) on a project to see if a solution can be developed that will exceed that of TVB.
TRANSFERABILITY	In place on the pipeline	In place on the pipeline	In place on the pipeline	If viable, the ESI solution will be configured for use on TAPS.
EFFECTIVENESS	No change	This technology has been developed specifically for TAPS. It is now being marketed as a commercial product by the developer.	No change	Unknown
COST	No change in existing O&M costs. The current system has been in place since startup of the pipeline system.	$2,300,000	No change in costs. The current system has been in place for a number of years.	Final cost is unknown at this time.
AGE AND CONDITION	Present system was installed at pipeline start-up.	This is a mature technology specifically developed for TAPS.		
COMPATIBILITY	No change	Compatible	No change	If viable, the ESI solution will be configured for use on TAPS.
FEASIBILITY	No change	Reconfigured system is now running on TAPS	No change	Alyeska is currently working with ESI on a project to see if a solution can be developed that will exceed that of TVB.

TABLE 4-17 (CONTINUED) PIPELINE LEAK DETECTION, MONITORING, AND OPERATING REQUIREMENTS

BAT Evaluation Criteria	Current Method 1 Line Volume Balance System	Current Method 2 Transient Volume Balance System	Current Method 3 Visual Identification	Alternative Method
ENVIRONMENTAL IMPACTS	No change	No impact	No change	Unknown

Section 5. Response Planning Standard [18 AAC 75.425(e)(5)]

5.1 RESPONSE PLANNING STANDARD CALCULATIONS [18 AAC 75.436]

The Response Planning Standard (RPS) volume for a crude oil pipeline is the volume of oil that results from the following formula:

RPS = (L-H) × C + FR × (TD + TSD)

where

L Pipeline length between pumping or receiving stations or valves

H Pipeline hydraulic characteristics due to terrain profile

C Pipeline capacity in barrels per linear measure

FR Pipeline flow rate in barrels per time period

TD Estimated time to detect a spill event

TSD Time needed to shut down the pipeline pump or system

The basis for determining the pipeline RPS is the TAPS Oil Spill Program. This computer program for calculating pipeline dynamic volumes is explained in Volume 1, Section 2.3.8, “Pipeline Dynamic Spill Volumes.”

The input parameters used by Alyeska for each of the above-related variables are summarized below.

Variable Alyeska Input Parameter

L Varies depending on valve location or pump station

H 100,000 survey data points of the pipeline showing milepost and elevation and pump station suction and discharge pressures for hydraulic gradient definition

C 2.15 bbls/ft

FR 1.5 million barrels per day (bpd)

TD Varies (refer to Volume 1, Section 2.3.8, “Pipeline Dynamic Spill Volumes”)

TSD 36 seconds plus remote gate valve (RGV) closure time of 4, 5, 8, or 12 minutes

The RPS may be reduced by prevention measures in place at the facility. Response time criteria are also applied in the RPS, which relates to the ability to contain and control within 72 hours that portion of the RPS that enters a receiving environment other than open water. The spill must be cleaned up in the shortest possible time consistent with minimizing damage to the environment.

The largest RPS volume for the pipeline is (b) (7) barrels located in the pipeline segment bounded by pipeline mileposts (b) (7)(F), (b) (3) A spill in this area has potential to reach an open-water river (Ray River) downstream of the spill zone. However, the majority of a spill would be absorbed on land within vegetation, mining tailings, or dry channels at/or above the bankfull stage.

In consultation with ADEC, one of the largest RPS of (b) (7)(F), (b) bound by (b) (7)(F), (b) (3) and apparent logistical challenges (distance from access roads and communications), was chosen to demonstrate a response to an open-water spill. A 5% prevention credit (Section 5.3, “Exemptions Applied to Response Planning Standards”) applied to arrival at a scenario, reduces the RPS release amount to 51,599 barrels. This RPS is located in Salcha River, Segment 5 and the pipeline is above ground.

Drainage patterns shown on aerial photographs in Volume 4, Section 2, show that a pipeline release at (b) (7)(F), (b) would flow along the right-of-way into Minton Creek. The terrain is lowland, spruce-hardwood forest characterized by stands of black spruce, birch, and aspen. Forest floor vegetation is made up of moss over loamy-peaty soil, grasses, and moderate willow underbrush. For purposes of this discussion, this spill occurs in summer conditions.

Review of Volume 1, Section 1.6.3, “Real-Time Surveillance and Tracking of Spill on Land and Water,” estimates 34% of oil from RPS release would be retained on land in depressions, vegetation, and soils. The remaining 66% of the RPS release would enter Minton Creek.

Initial RPS Release
Retained On Land

Open Water RPS

(b) (7)(F), (b) (3)

Minton Creek is described as an incised stream in a floodplain covered with a dense growth of grass and willows. The width of the stream at normal flow is 5 to 15 feet. Stream velocity at normal flow ranges from 0 to 3 feet per second (fps). The Minton Creek scenario is found in Volume 2.

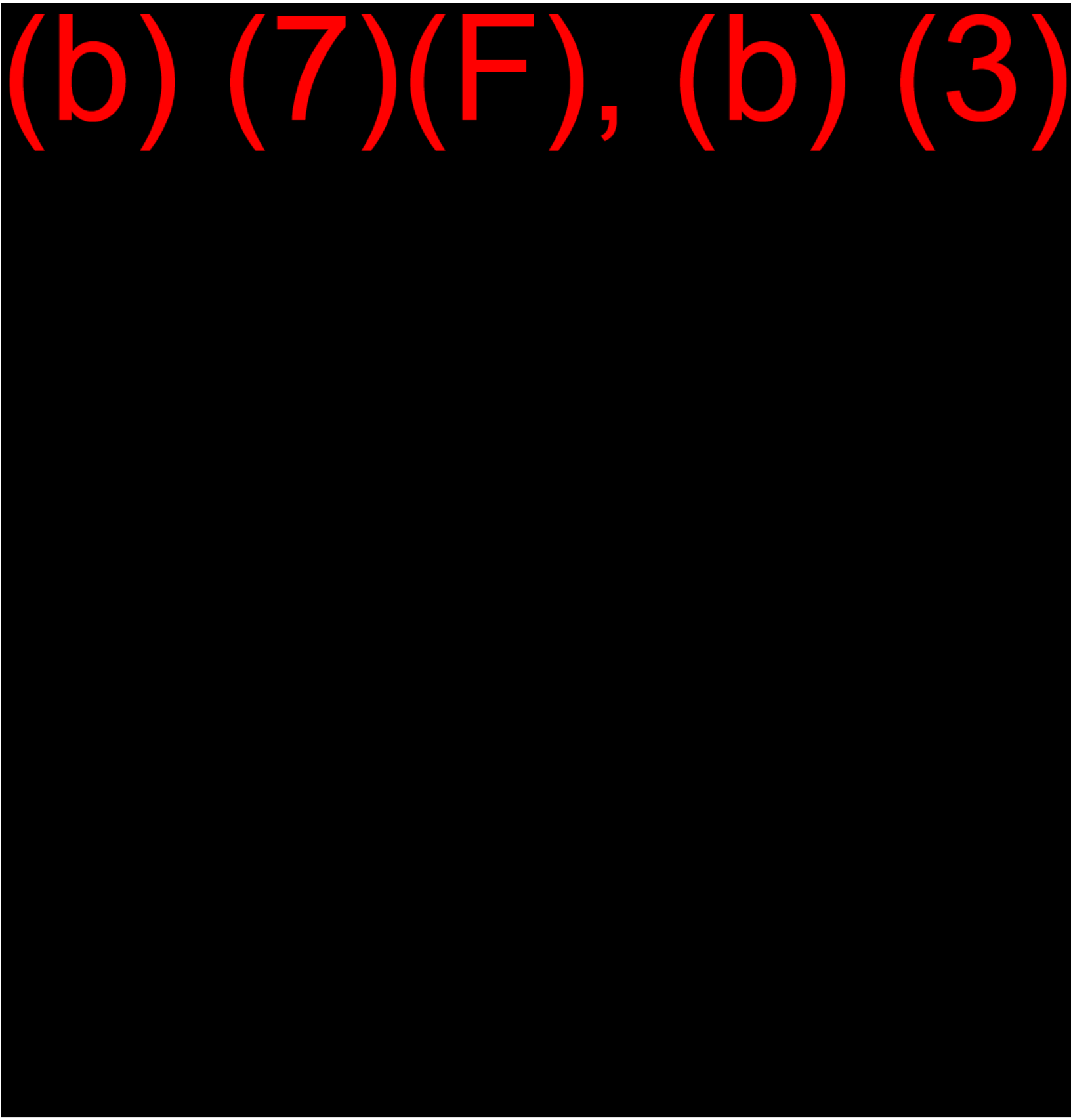
5.2 DETERMINING RPS FOR PUMP STATIONS [18 AAC 75.436]

Trans-Alaska pipeline pump stations are located along the 800-mile pipeline. Pump station facilities are generally similar in layout, station components, and operational function. The components of a pump station of interest in determining an oil discharge RPS are crude oil and fuel oil tanks.

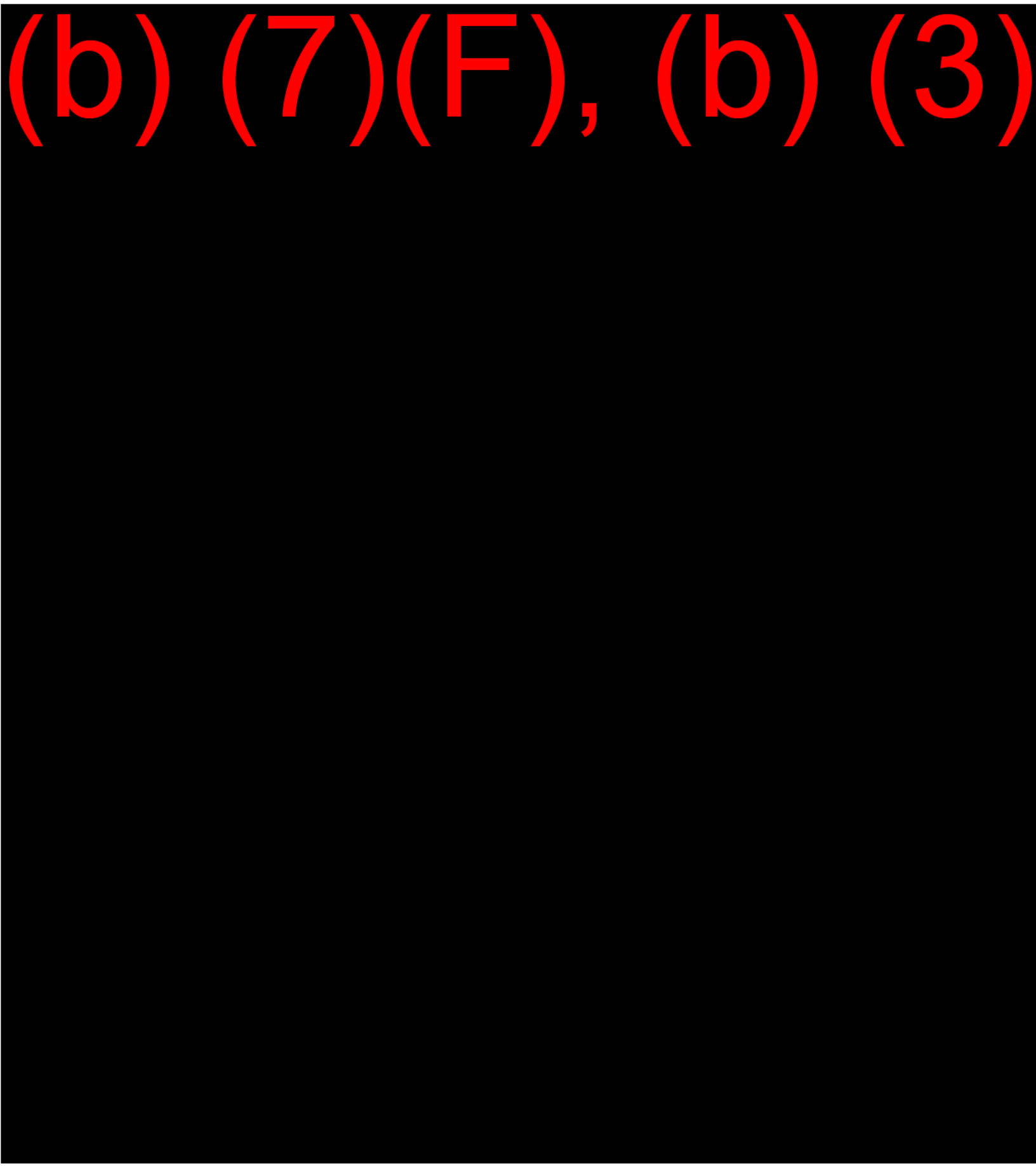
The amount of oil available to spill from tankage at pump stations will vary due to:

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)


(b) (7)(F), (b) (3)

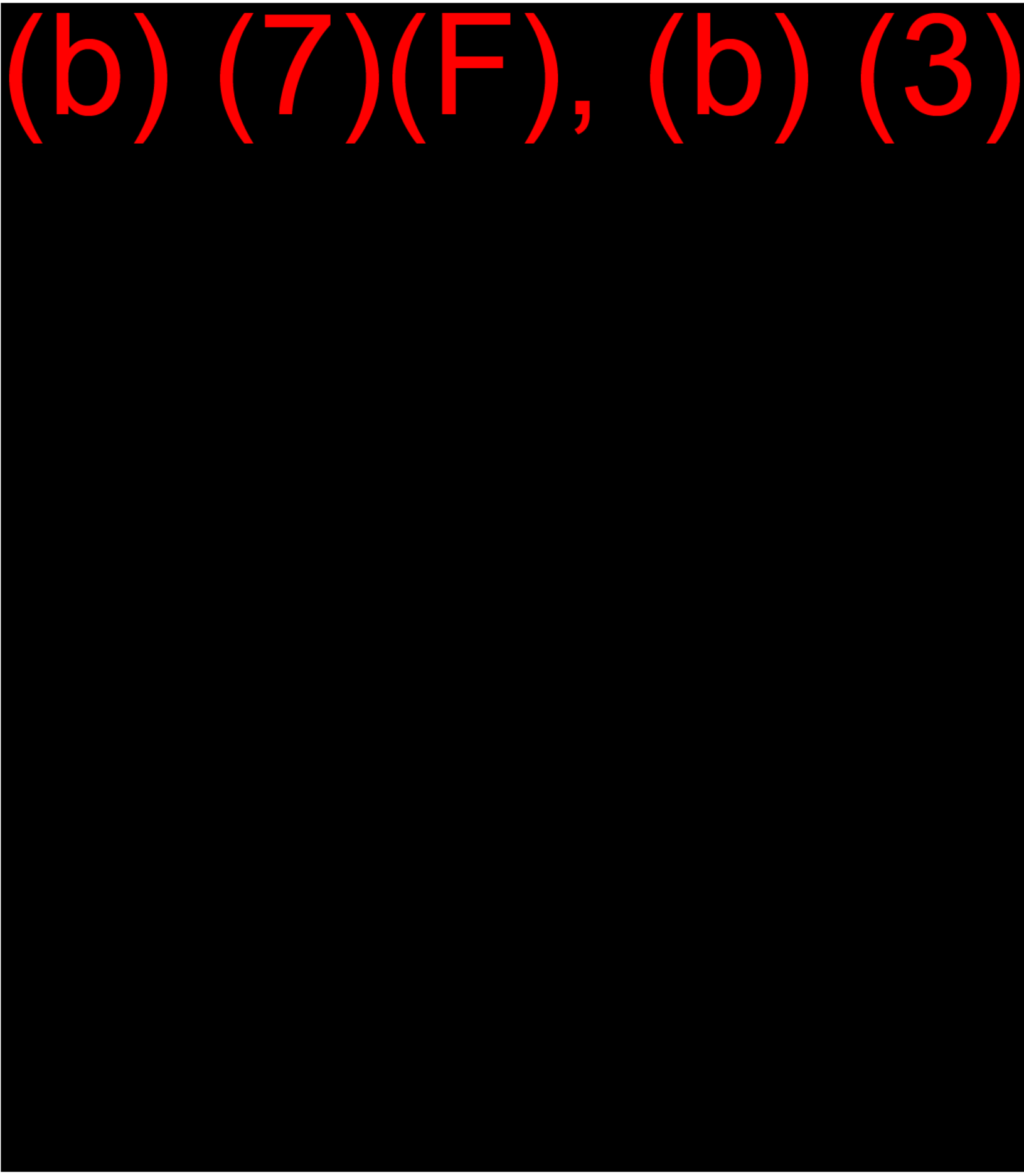
[redacted]


(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)


(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)


(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Pump Station	Tank/Volume	On Land	Open Water	Notes
(b) (7)(F), (b) (3)				

5.3 EXEMPTIONS APPLIED TO RESPONSE PLANNING STANDARDS [18 AAC 75.436]

5.3.1 Credited Response Planning Standard for the Pipeline

Alyeska's response planning standard (RPS) for the pipeline is (b) (7)(F), (b) , reflecting credits for oil spill prevention measures that are in place. The prevention programs for the trans-Alaska pipeline system cover a broad spectrum from special design and construction to enhanced operating procedures. Alyeska has implemented procedures, practices, and design measures that have and are expected to prevent, stop, reduce, or mitigate the occurrence of oil spills or the impact of spills.

The RPS of (b) (7)(F), (b) equals 95% of 54,314 barrels. Alyeska's TAPS Oil Spill Program calculated an initial, unreduced RPS of 54,314 barrels of Alaska North Slope crude oil in conformance to *18 AAC 75.436(b)*. In accordance with *18 AAC 75.436(c),* "Response Planning Standards for Crude Oil Pipelines," prevention credits reflecting Alyeska's preventive measures are applied to reduce the initial RPS volume. Those credits are summarized below.

- (b) (7)(F), (b) (3)

5.3.2 Credited Response Planning Standard for the Pump Stations

(b) (7)(F), (b) (3)

The rationale for the credits identified for the pipeline and pump stations is provided below.

5.3.3 Alcohol and Drug Testing

Information on alcohol and drug testing is provided in Volume 1, Section 2.1.2, "Substance Abuse Programs."

5.3.4 Secondary Containment Areas – Storage Tanks

Information on secondary containment areas for storage tanks is provided in Volume 1, Section 2.1.7, "Description of Secondary Containment Areas."

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Appendix A Environmental Protection Agency (EPA) Facility Response Plan Cross-Reference (Non-Transportation Related)

A.1 Introduction

This appendix provides a cross reference to the *Pipeline Oil Discharge Prevention and Contingency Plan* (*CP-35-1*) portions related to spill prevention and response actions, which will take place at pipeline pump stations or related facilities under the U.S. Environmental Protection Agency (EPA) jurisdiction. By agreement between the U.S. Department of Transportation (DOT) and the EPA, EPA jurisdiction, associated with a facility response plan, is limited to non-transportation-related bulk oil storage (i.e., turbine fuel tanks).

This cross reference is limited to facilities that store turbine fuel in a tank, or tanks, where the total oil (turbine fuel) storage capacity is greater than or equal to 1 million gallons (b) (7) (F) (b) barrels).

The on-line pump station meeting the greater than or equal to 1 million gallon threshold is:

- (b) (7)(F), (b) (3)

Pump Stations 1, 3, 4, 5, and 9 store, and have storage capacity for, less than 1 million gallons of fuel.

A.2 Emergency Response Action Plan [40 CFR 112.20(h)(1)]

A.2.1 Qualified Individual Notification Phone List

- Table 1 on page 2 in Volume 1

A.2.2 Identity of Individuals and Organizations to be Contacted

- Table 1-7 in Volume 1, Section 1.5.1, "Initial Response Teams (IRTs)"
- Volume 1, Section 1.2.1, "Initial Reporting"

A.2.3 Spill Response Notification Form

- Volume 1, Section 1.1.1, "Assessment"
- Figure 1-1, "OCC Spill/Emergency Report Data Sheet (Form 0009)"

A.2.4 Response Equipment List and Location

- Volume 1, Section 3.6.1, "Location, Inventory, and Ownership of Equipment"

A.2.5 Response Personnel Capabilities, Response Time, and Qualifications

- Volume 1, Section 3.3, "Incident Command System"
- Volume 1, Section 3.9, "Oil Spill Training and Exercise Programs"

A.2.6 Evacuation Plans

- *EC-71-07, Emergency Contingency Action Plan, Pump Station 7,* Section 7, "Evacuation"

A.2.7 Immediate Actions

- Volume 3, Section 4.1, "Containment and Exclusion"
- Volume 3, Section 4.3.6, "Cleanup Techniques"

A.2.8 Facility Diagrams

- Volume 1, Section 1.8, Figure 1-28, "Pump Station 7 Site Plan and Facility Drainage"
- *SP-77-07, Spill Prevention Control and Countermeasure Plan, Pump Station 7 (Pipeline* (b) (7)(F), (b) (3) *),* Figure 1, "Storage and Transfer Areas"

A.3 Facility Information [40 CFR 112.20(h)(2)]

A.3.1 Facility Name and Location

- Alyeska Pipeline Service Company, trans-Alaska pipeline

A.3.2 Latitude and Longitude

- Appendix A, "Response Plan Cover Sheet - Pump Station 7," page A-19

A.3.3 Wellhead Protection Plan

- Not applicable

A.3.4 Owner/Operator

Alyeska Pipeline Service Company
3700 Centerpoint Drive
Anchorage, AK 99503-5827

A.3.5 Qualified Individual for Pump Station 7

- Qualified Individual for PS07

  John Baldridge
  Senior Director, Pipeline Operations
  615 Bidwell Street
  Fairbanks, AK 99701
  Work - (907) 450-7746

- Incident Commander/Alternate Qualified Individual

- Operations and Maintenance Supervisor, PS05/07 x4502

A.3.6 Date of Oil Storage Start-Up

- July 1977

A.3.7 Current Operation

- Oil/Pipeline Transportation

- Standard Industrial Classification Code - 4612

A.3.8 Date and Type of Substantial Expansion

- Not applicable

A.4 Emergency Response Information [40 CFR 112.20(h)(3)]

A.4.1 Identity of Personnel and Equipment for Worst Case Discharge

- Volume 1, page 2, Table 1, "Qualified Individuals – Pipeline Plan"
- Volume 1, Introduction, "Plan Approval and Commitment of Resources"
- Volume 1, Section 1.2.3, Table 1-3, "Regulatory Agency Emergency Contact Information"
- Volume 1, Section 1.1.1, "Assessment"
- Volume 1, Section 1.4, "Communications"
- Volume 1, Section 1.5.3, "Procedures to Notify and Mobilize Response Action Contractors "
- Volume 1, Section 1.5.4, "Equipment Locations"
- Volume 1, Section 1.5.6, "Personnel"
- Volume 1, Section 3.6, "Response Equipment"
- Volume 3, Tactics

A.4.2 Evidence of Contracts

- Volume 1, Section 1.5.3, "Procedures to Notify and Mobilize Response Action Contractors"

A.4.3 Identity and Phone Numbers of Individuals and Organizations

- Volume 1, Section 1.2.1, "Initial Reporting"
- Volume 1, Section 1.5.1, "Initial Response Teams (IRTs)"

A.4.4 Information Given to Response Personnel

- Volume 1, Section 1.1.1, "Assessment"

A.4.5 Response Personnel Capabilities, Response Time, and Qualifications

- Volume 1, Section 3.3, "Incident Command System"
- Volume 1, Section 3.9.1, "Training Program"

A.4.6 Description of Response Equipment, Location, and Equipment Testing

- Volume 1, Section 3.6, "Response Equipment"
- Volume 1, Section 3.6.1, "Location, Inventory, and Ownership of Equipment"
- Volume 1, Section 3.6.5, "Equipment Maintenance"

- Volume 3, Section 5, "Containment Sites Deployment Tactics"

A.4.7 Evacuation

- *EC-71-07, Emergency Contingency Action Plan, Pump Station 7*, Section 7, "Evacuation"

A.4.8 Facility Diagrams

- Volume 1, Section 1.8, Figure 1-28, "Pump Station 7 Site Plan and Facility Drainage"

A.4.9 Qualified Individual's Duties

- Volume 1, Section 3.3, "Incident Command System"

A.5 Hazard Evaluation [40 CFR 112.20(h)(4)]

A.5.1 Hazard Identification

- Volume 1, Section 2.1.6, "Oil Tanks"
- Volume 1, Section 2.2, "Discharge History"
- Volume 1, Section 2.3, "Potential Discharge Analysis"

A.5.2 Vulnerability Analysis

- Volume 1, Section 1.6.4, "Methods to Exclude Spill from Sensitive Areas"
- Volume 3, Section 3, "Containment Actions"

Vulnerability	Analysis
(b) (7)(F), (b) (3)	[redacted]
Wetlands or Other Sensitive Environments	Undeveloped forest and shrub wetlands surround the facility. Minto Flats State Game Refuge is 11 miles away.
Fish and Wildlife	The nearest anadromous stream (Tolovana River) is 12 miles away. PS07 is in a black bear concentration area. A known moose rutting area is 3 miles to the southwest.

Vulnerability	Analysis
Lakes and Streams	An intermittent tributary of the Tatalina River is located 0.4 mile from PS07.
Endangered Flora and Fauna	No endangered species in the area.
(b) (7)(F), (b) (3)	[redacted]
Transportation Routes	The facility is located approximately 0.5 mile from the Elliott Highway.
Utilities	No public utilities in the area; nearest is 27 miles away in Livengood.
Other Areas of Economic Importance	No subsistence use is reported in the area; nearest is 39 miles northwest of the facility.

A.5.3 Analysis for the Potential for an Oil Spill at Pump Station 7

- Volume 1, Section 2.3, "Potential Discharge Analysis"
  Table 2-16 lists the potential spill sources at Pump Station 7. As described in Section 2.3.4.2, pump station spills have been small and infrequent. Of the 276 pump station spills from 1977 to 2002, only four events resulted in 50 barrels or more spilled; none have occurred since 2003. Due to strategic reconfiguration, pump station spill frequency and overall likelihood of a leak are predicted to decrease.

- Volume 1, Section 2.4, "Conditions Increasing Risk of a Discharge" describes natural conditions and events that might increase the risk of a discharge.

- The consequences of a spill on human activity and fish and wildlife and sensitive areas are limited based on the distance from PS07 to these locations. It is highly unlikely that a discharge would impact human health, property, or the environment based on the vulnerability analysis in A.5.2.

A.5.4 Facility Oil Spill History

- Volume 1, Tables 2-7 and 2-8 show that two spills have occurred (b) (7)(F), (b) from June 1977 to December 2010. Equipment failure (1980) and fuel transfer (1987) are the causes listed.

A.6 Discharge Scenarios [40 CFR 112.20(h)(5)]

A.6.1 Small and Medium Discharges

- Not applicable

A.6.2 Worst Case Discharge

(b) (7)(F), (b) (3)

[redacted]

A.6.3 Worst Case Discharge Planning Distance Calculation

- D1 (distance from discharge to storm drain or open concrete channel to navigable water) = N/A (none present at the facility)
- D2 (distance through storm drain or open concrete channel to navigable water) = N/A (see D1)
- D3 (distance downstream from the outfall to fish and wildlife and sensitive environments or a public drinking water intake) = N/A (see D1 and D2)

(b) (7)(F), (b) (3)

[redacted]

A.6.4 Pump Station 7 Tank Spill Scenario

After the initial mobilization and ramp-up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how

heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

Reader Note: This scenario assumes the entire contents are released beyond secondary containment. The secondary containment provides approximately 186 percent of the tank's capacity; as such, a discharge of this volume is unlikely to occur.

(b) (7)(F), (b) (3)

[redacted]

Regulatory/ Response Area	Initial Actions – Hour 0-2 Day 1 (1200-1300)	Hour 2-4 Day 1 (1300-1600)	Hour 4 through Night Shift Day 1 (1600-0600)
Situation/Stat	Spring season. Winds from S at 10 mph. Temperature 35ºF. No precipitation. Tank 37-TK-178 ruptures. (b) (7)(F), (b) (3) of turbine fuel are discharged.	Turbine fuel flows southeast across the gravel pad and off pad towards an intermittent tributary of Globe Creek. Turbine fuel does not reach Globe Creek. Approximately 50 percent of the spill is contained in the impoundment or dissipates. Approximately 10,027 bbl calculated for on-water recovery. Approximately 6,016 bbl calculated for onshore recovery.	
Objectives and Strategies	**Objectives**	**Strategies**	
	Site security: safety, site control, surveillance	Review initial safety assessment. A site safety assessment is conducted to ascertain the immediate threat to the personnel at the pump station. The Incident Commander places the pump station on notice that an evacuation may be required.	
	Cleanup and countermeasures on land	If it is safe to do so, Tank 37-TK-178 is de-inventoried. Restrict the spread of spilled oil.	
	Cleanup and countermeasures on water	Deploy task forces; mobilize resources to maximize containment and recovery. Initiate free oil recovery beyond primary containment areas. Track oil movement.	
	Protection of sensitive resources and wildlife	Initiate identification of environmentally sensitive areas (ESAs).	
	Agency and stakeholder notification	The following state and federal agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). These notifications are followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.	

Regulatory/ Response Area	Initial Actions – Hour 0-2 Day 1 (1200-1300)	Hour 2-4 Day 1 (1300-1600)	Hour 4 through Night Shift Day 1 (1600-0600)
Fire Prevention, Control, and Safety	The first responder to the spill site brings air monitoring equipment and completes an initial site safety assessment. The information is radioed to the Incident Commander and is used to ascertain the immediate threat to the personnel at the pump station and verify that all responders have appropriate personal protective equipment (PPE) before entering the spill site. The Incident Commander places the pump station on notice that an evacuation may be required.	A site safety analysis utilizing the "Site Safety and Control Analysis" form (Form ICS 201-5) is completed to provide identification of potential hazards PPE requirements, and to establish decontamination for responders. Access to the spill site is carefully controlled, and the scene is secured. All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is > 20%, additional fire and safety precautions are initiated to eliminate ignition sources. Incipient level fire suppression equipment is provided on site. This may include a wheeled fire truck(s). Additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of non-sparking or intrinsically safe equipment and elimination of open flames. The firefighters arrive at T + 4 hour. The primary mission of firefighters is personnel safety and protection. Decontamination will be set up at the spill site.	
Discharge Tracking		The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Visual surveillance tracking is done on the ground by containment and recovery operations personnel who identify the extent of spread of the spilled oil. The extent of the release is marked with stakes on the pad and on vegetation surrounding PS07. The stakes are checked every hour for the first 24 hours of the spill to determine if the spill is spreading. The Incident Commander tracks the discharge on a situation status map. Tracking reports will be made to the Emergency Operations Center via radio on an hourly basis at a minimum.	
Protection of Environment-ally Sensitive Areas (ESAs)	Turbine fuel flows southeast across gravel pad and flows through surrounding vegetation towards an intermittent tributary to Globe Creek. The response team consults the Alaska Regional Response Team (RRT) *Interior Subarea Plan* list of areas of major concern. No priority sites lie within the spill area per the subarea plan. The On-Scene Incident Commander identifies the priority objective as containment of turbine fuel to the smallest footprint practicable. Fish are present in Globe Creek, and waterfowl use floodplains adjacent to Tatalina River. Objectives are to prevent oil from reaching or traveling to Globe Creek.		

Regulatory/ Response Area	Initial Actions – Hour 0-2 Day 1 (1200-1300)	Hour 2-4 Day 1 (1300-1600)	Hour 4 through Night Shift Day 1 (1600-0600)
Initial Response Actions and Stopping Discharge at Source	OCC conducts notifications per TAPS ODPCP Volume 1, Section 1.2. Federal and state agencies are notified (ADEC, NRC). The immediate objective is to stabilize the weakened area of the secondary containment and prevent further escape of oil. Responders, the Safety Officer, and the Environmental Coordinator are requested out of Fairbanks Response Base. All notifications are made to proper personnel and agencies. Tank shut-in procedure is evaluated to ensure possible sources have been secured. The Safety Officer completes an initial assessment of the spill and an initial site safety assessment as described above. This is completed by T + 2 hours. The Fairbanks Response Base personnel are activated and arrive at the spill site at T + 2 hour. Fairbanks Response Base personnel begin deployment activities.	Containment and recovery task force personnel submit tracking reports to the Incident Command Center on an hourly basis. The Mobile Command Post and "Go Team" are set at PS07.	
Staging Areas Mobilization	Staging area is established at PS07. Personnel and equipment are mobilized to the staging area at times noted in the resource table (Sections A.6.4.1 and A.6.4.2).		

Regulatory/ Response Area	Initial Actions – Hour 0-2 Day 1 (1200-1300)	Hour 2-4 Day 1 (1300-1600)	Hour 4 through Night Shift Day 1 (1600-0600)
Response Actions **Task Force 1 (TF-1)** **(On-Pad Containment and Recovery)**	Four responders are requested from Fairbanks Response Base for the night shift. ETA is T + 8 hours.	A 4-person response crew arrives on site at T + 2 hours and constructs containment berms around the perimeter of the release on the gravel pad. By T + 3 hours, TF-1 utilizes a vacuum truck located on site to pump free oil from the secondary containment. TF-1 also utilizes a pump and hose to pump oil from bermed area.	Recovered free liquid is temporarily stored in tanks on site for re-injection into the pipeline. The berm is shored up on an ongoing basis, as needed. A 4-person response crew (night shift) arrives on site at T + 6 hrs.
Response Actions **Task Force 2 (TF-2)** **(On-Water Containment and Recovery)**	Two-person response team is mobilized, via helicopter, with boom and absorbent pads to an area of opportunity on the intermittent tributary downstream of the leading edge of the spill. An additional four responders mobilize from the Fairbanks Response Base.	The 2-person response team arrives via helicopter at an area of opportunity on the tributary at T + 3 hours and deploy boom. The 4-person response team arrives at the PS07 staging area at T + 2 hours. By T + 2.5 hours, responders begin deploying containment boom and begin recovery using skimmers, pumps, hoses, and bladder tanks.	
Response Actions **Task Force 3 (TF-3)** **(Off-Pad Containment and Recovery)**	A 4-person response team is mobilized with shovels.	Responders arrive on site at T + 2 hours. Using shovels, responders construct berms around edges of oil.	TF-3 utilizes manual methods to remove oiled gravel in areas with limited access and to use absorbents to remove diesel from vegetation. Onsite personnel recover oiled gravel with shovels and a loader.

Regulatory/ Response Area	Initial Actions – Hour 0-2 Day 1 (1200-1300)	Hour 2-4 Day 1 (1300-1600)	Hour 4 through Night Shift Day 1 (1600-0600)
Plans, Procedures, and Locations for Temporary Storage and Disposal		Recovered liquids are temporarily stored in empty tanks.	Solid waste will be segregated and placed in clear bags: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area in an old material site as close to PS07, as is practical. This soil will be thermally remediated on site. Contaminated soil is managed per the waste management plan approved by ADEC.
Transfer and Storage of Recovered Oil; Volume Estimating Procedure		Recovered fluids are temporarily stored in empty tanks. Recovered liquids are gauged and manifested for disposal or recycling, as appropriate. If recovered liquids are re-injected into the pipeline (b) (7) (F) (b), they are measured prior to re-injection. Disposal occurs at an approved processing center.	
Wildlife Protection/ Rehabilitation	A wildlife response operation is immediately initiated as outlined in Volume 1, Section 1.6.9, "Wildlife Response Plan." The International Bird Rescue (IBR) out of Berkeley, California, is notified and requested to mobilize.	The IBR arrives on location within 24 hours and takes over coordination of overall wildlife response operation.	

Regulatory/Response Area	Day 2 – 3
Response Actions **Task Force 1 (TF-1)** **(On-Pad Containment and Recovery)**	TF-1 utilizes a loader or equivalent to recover oiled gravel on the pad.
Response Actions **Task Force 2 (TF-2)** **(On-Water Containment and Recovery)**	TF-2 continues recovering turbine fuel from the intermittent tributary by using skimmers and absorbents.
Response Actions **Task Force 3 (TF-3)** **(Off-Pad Recovery)**	TF-3 utilizes a loader or equivalent to remove oiled vegetation and soil. Manual methods are used in areas with limited access.
Contaminated Soil Cleanup	Once the spill is contained, the response turns into a contaminated soil cleanup operation. The final cleanup plan will be discussed with applicable state and federal agencies prior to implementation.

A.6.4.1 Resource Mobilization

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
2 Dozers	(b) (7)(F), (b) (3)	Construct berm	On Site
2 Loaders		Recover contaminated gravel	On Site
Trash pump, plus hoses		Diesel recovery and transfer	On Site
Tank (open top and bladder)		Temporary storage	On Site
4-person response crew (TF-1)		Labor	T + 2 hr
6-person response crew (TF-2)		Labor	T + 2 hr
4-person response crew (TF-3)		Labor	T + 2 hr
Absorbents/sorbent boom		Containment and recovery on shoreline	On Site
Skimmer, pumps, hoses, containment boom		Containment and recovery on water	On Site
Shovels		Recovery off pad	On Site
Stakes and flags		Delineation of contamination	On Site
Bags		Absorbent disposal and PPE disposal	On Site
Crew cab trucks (2)		Transport	On Site
Commercial poly		Liner	On Site
Fire truck with crew (2)		Fire suppression	T + 4 hr
4-person response crew (TF-1 night shift)		Labor	T + 6 hr
4-person response crew (TF-2 night shift)		Labor	T + 6 hr
4-person response crew (TF-3 night shift)		Labor	T + 6 hr

A.6.4.2 Recovery/Remediation Equipment

Task Force	Number of Systems	Recovery / Containment System	Mobilization/ Deployment Time to Site	Operating Time
TF-1 On-Pad Recovery	1	Centrifugal pump/hose	On Site	20 hours
	2	Diaphragm pump/hose	On Site	20 hours
	1	Vacuum truck	On Site	20 hours
TF-2 On-Water Recovery	1	Centrifugal pump/hose	On Site	20 hours
TF-3 Off-Pad Recovery	2	Diaphragm pump/hose	On Site	20 hours
	1	Vacuum truck	On Site	20 hours

A.7 Discharge Detection Systems [40 CFR 112.20(h)(6)]

A.7.1 Discharge Detection by Personnel

- Volume 1, Section 2.1.8.3, "Pipeline Leak Detection"
- Volume 1, Section 2.1.8.4, "Pump Station Leak Detection"

A.7.2 Automated Discharge Detection

- Volume 1, Section 2.1.8.3, subheading, "On-Line Leak Detection"

A.8 Plan Implementation [40 CFR 112.20(h)(7)]

A.8.1 Response Resources for Small, Medium, and Worst Case Spills

- Volume 1, Section 1.5, "Deployment Strategies"
- Volume 1, Section 1.5.3, "Procedures to Notify and Mobilize Response Action Contractors"
- Volume 1, Section 3.5, "Logistical Support"
- Volume 1, Section 3.6, "Response Equipment"
- Volume 1, Section 3.7, "Non-Mechanical Response Information"
- Volume 1, Section 3.9, "Oil Spill Training and Exercise Programs"
- Volume 2, Scenarios

- Volume 3, Section 4.3.2, “Response Equipment”
- Volume 3, Section 5, “Containment Site Deployment Tactics”

A.8.2 Disposal Plan

- Volume 2, Scenarios
- Volume 3, Section 4.5, “Recovered Oil Transfer, Storage, and Disposal”

A.8.3 Containment Planning

- Volume 1, Section 3.1.4, “Secondary Containment and Drainage”

A.8.4 Drainage Planning

- Volume 1, Section 3.1.4, “Secondary Containment and Drainage”

A.9 Self-Inspection, Drills/Exercises, and Response Training [40 CFR 112.20(h)(8)]

A.9.1 Facility Self-Inspection

- *SP-77-07, Spill Prevention Control and Countermeasure Plan, Pump Station 7, (Pipeline* (b) (7)(F), (b) (3)

A.9.1.1 Tank Inspection

- Volume 1, Section 2.1.6, “Oil Tanks”
- SIP 4001, “External Tank Inspection,” is used to document routine in-service inspections of tanks with a capacity equal to or greater than (b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

- All portable oil containers at the facility receive inspections conducted in accordance with STI SP001 that are documented using model work order 40019747, “M01 – SPCC INSP PORTABLE CONTAINERS/(b) (7)(F), (b) (3).” Portable equipment (b) (7)(F), (b) that has integrated fuel storage equal to or greater than 55 gallons is inspected during routine use and during scheduled preventive maintenance. Records of equipment maintenance are stored in Alyeska’s Fleet Focus database.

A.9.1.2 Response Equipment Inspection

- Volume 1, Section 3.6.5, “Response Maintenance”
  All Alyeska fleet units (owned, leased, and rented), including units identified as part of the OSCP inventory, are included in Alyeska’s Fleet Focus database.

A.9.1.3 Secondary Containment Inspection

- Volume 1, Section 2.1.7, “Description of Secondary Containment Areas”
- SIP 4001, “External Tank Inspection,” is used to document routine in-service inspections of tanks as described above; secondary containment areas are inspected at the same time using this form.
- Note: Surface impoundments are not present at the facility.

A.9.2 Facility Drills and Exercises

- Volume 1, Section 3.9.10, “Oil Spill Exercises”

A.9.2.1 Qualified Individual Notification Drill Logs

- Volume 1, Section 2.1.1.4, “Maintenance of Training Records”

A.9.2.2 Spill Management Team Tabletop Exercise Logs

- Volume 1, Section 2.1.1.4, “Maintenance of Training Records”

A.9.3 Response Training

- Volume 1, Section 3.9, “Oil Spill Training and Exercise Programs”

A.10 Diagrams [40 CFR 112.20(h)(9)]

- Volume 1, Section 1.8, Figure 1-28, “Pump Station 7 Site Plan and Facility Drainage”

A.11 Security [40 CFR 112.20(h)(9)]

- Volume 1, Section 2.1.4, “Security Programs”

A.12 Response Plan Cover Sheet [40 CFR 112.20(h)(11)]

- “Response Plan Cover Sheet - Pump Station 7” on page A-19.

Response Plan Cover Sheet – Pump Station 7
Page 1 of 2

General Information

Owner/Operator of Facility: Alyeska Pipeline Service Company

Facility Name: Pump Station 7

Facility Address (street address/route): Refer to Latitude/Longitude; North of Fairbanks, Elliott Highway Milepost (b) (7)(F),

Facility Phone No.: 907-450-4700

Latitude (degrees north): (b) (7)(F), (b) (3)

Longitude (degrees west):

Largest Aboveground Oil Storage Tank Capacity (gallons): (b) (7)(F), (b) (3)

Number of Aboveground Oil Storage Tanks: 7 tanks

Standard Industrial Classification (SIC) Code: 4612 - Crude Petroleum Pipeline

Maximum Oil Storage Capacity (gallons): (b) (7)(F), (b) (3)

Worst Case Oil Discharge Amount (gallons):

Facility Distance to Navigable Water. Mark the appropriate line:

0 - ¼ mile	¼ - ½ mile	½ - 1 mile	>1 mile
			X

Dun & Bradstreet No: 05 258 1758

Response Plan Cover Sheet - Pump Station 7

Page 2 of 2

Applicability of Substantial Harm Criteria

Does the facility transfer oil over water to or from vessels, and does the facility have a total oil storage capacity greater than or equal to 42,000 gallons?

Yes _____ No ___X___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons? Within any storage area, does the facility lack secondary containment that is sufficiently large to contain the capacity of the largest aboveground oil storage tank, plus sufficient freeboard to allow for precipitation?

Yes _____ No ___X___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons? Is the facility located at a distance (as calculated using the appropriate formula in *40 CFR 112*, Appendix C, or a comparable formula) such that a discharge from the facility could cause injury to fish and wildlife and sensitive environments?

Yes _____ No ___X___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons? Is the facility located at a distance (as calculated using the appropriate formula in *40 CFR 112*, Appendix C, or a comparable formula) such that a discharge from the facility would shut down a public drinking water intake?

Yes _____ No ___X___

Does the facility have a total oil storage capacity greater than or equal to 1 million gallons? Has the facility experienced a reportable oil spill in an amount greater than or equal to 10,000 gallons within the last five years?

Yes _____ No ___X___

Certification

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and, that based on my inquiry of those individuals responsible for obtaining information, I believe that the submitted information is true, accurate, and complete.

Signature _____

Title Senior Director, Pipeline Operations

Date _____

EPA OPA 90 Response Resources Worksheet

Part I Background Information

(b) (7)(F), (b) (3)

[redacted]

Step (A): Calculate Worst Case Discharge in barrels (40 CFR 112 Appendix D)

Step (B): Oil Group (Section 1.2 of 40 CFR 112 Appendix E)

Step (C): Operating Area (choose one)

[X] Nearshore/Inland/Great Lakes [ ] or River and Canals

Step (D): Percentages of Oil (Table 2 of 40 CFR 112 Appendix E)

Percent Lost to Natural Dissipation

Percent Recovered Floating Oil

Percent Oil Onshore

Step (E): Recovery (in barrels)

On-Water Oil Recovery: $\frac{\text{Step (D2) x Step (A)}}{100}$

Onshore Recovery: Step $\frac{\text{(D3) x Step (A)}}{100}$

Step (F): Emulsification Factor (Table 3 of 40 CFR 112 Appendix E)

Step (G): On-Water Oil Recovery Resource Mobilization Factor
(Table 4 of 40 CFR 112 Appendix E)

Tier 1 (12-hr arrival)

Tier 2 (36-hr arrival)

Tier 3 (60-hr arrival)

(b) (7)(F), (b) (3)

Part II On-Water Recovery Capacity (barrels/day)
(Recovery capacity that must be planned for)

Tier 1 (12-hr arrival): Step (E1) x Step (F) x Step (G1)

Tier 2 (36-hr arrival): Step (E1) x Step (F) x Step (G2)

Tier 3 (60-hr arrival): Step (E1) x Step (F) x Step (G3)

Part III Onshore Cleanup Volume (barrels)
(Shoreline cleanup capacity that must be planned for)

Step (E2) x Step (F)

Part IV On-Water Response Capacity By Operating Area
(Table 5 of Appendix E)(Amount needed to be contracted for in barrels/day)

Tier 1 (12-hr arrival)

Tier 2 (36-hr arrival)

Tier 3 (60-hr arrival)

Part V On-Water Amount Needed to be Identified, but not contracted for in Advance (barrels/day)

Tier 1 (12-hr arrival): (H1) - (J1)

Tier 2 (36-hr arrival): (H2) - (J2)

Tier 3 (60-hr arrival): (H3) - (J3)

Note: To convert to gallons/day, multiply barrel/day by 42.

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Appendix B U.S. Department of Transportation Facility Response Plan (Transportation Related)

U.S. Department of Transportation (Pipeline and Hazardous Material Safety Administration) cross reference for an onshore oil pipeline (49 CFR 194). PHMSA Tracking Numbers 0388; 1138-1149 TAPS.

B.1 Consistency With National Contingency Plan and Area Contingency Plan

- National Contingency Plan and Area Contingency Plan(s) Volume 1, Introduction
- Volume 1, Section 3.3.1, "Description of ICS and Unified Command"
- Volume 1, Section 1.2.4, "Community, State, and Federal Government Coordination"

B.2 Information Summary

- Name and address of the operator:

  Alyeska Pipeline Service Company
  3700 Centerpoint Drive
  Anchorage, AK 99503-5827
  (907) 787-8700

- Response zone(s) that meet the criteria for significant and substantial harm:

  The 800-mile Trans Alaska Pipeline System is considered one response zone which transverses the North Slope Borough beginning at Pipeline Mile Post (PLMP) 0 to PLMP 178, the Fairbanks North Star Borough beginning at PLMP 423 through PLMP 513, the City of Valdez beginning at PLMP 778 through PLMP 800 and is situated within the State of Alaska.

  Further detailed information related to plan organization can be found in the Volume 1, Introduction under "Purpose and Organization of Plan."

  Alyeska considers any spill along the 800-mile pipeline to have the potential of causing "significant and substantial harm" due to the proximity of seasonally open water, i.e., navigable waters or adjoining shorelines, wildlife in the area, or its possible occurrence within a one-mile radius of an environmentally sensitive area.

- Name and telephone number of designated Qualified Individual(s) and Alternate Qualified Individuals:

  This listing is found in Table 1, Volume 1, page 2.

- The type of oil of the worst case discharge:

  North Slope Crude oil is the type of oil of the worst case discharge.

- Identify the volume of the worst case discharge:

(b) (7)(F), (b) (3)

[redacted]

B.3 Notification Procedures

- Volume 1, Section 1.2, “Reporting and Notification”

B.4 Spill Detection Procedures

- Volume 1, Section 2.1.8.3 subheading, “On-Line Leak Detection”
- Volume 1, Section 5.1, “Response Planning Standard Calculations”

B.5 Response Activities

- Volume 2, Scenarios
- Volume 1, Section 1.1, “Emergency Action Checklist”
- Volume 1, Section 1.5, “Deployment Strategies”
- Volume 1, Section 1.7, “Non-Mechanical Response Options”
- Volume 1, Section 3.3, “Incident Command System”

B.6 Worst Case Discharge Calculations

- Volume 1, Section 2.3, “Potential Discharge Analysis”
- Volume 1, Section 2.3.7, “Projections of Future Spill Risks”

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Appendix C Alaska Department of Environmental Conservation Oil Discharge Prevention and Contingency Plan Cross Reference

C.1 Response Action Plan

C.1.1 Determining the Response Planning Standard

- Volume 1, Section 5, “Response Planning Standard Calculations”

C.1.2 Emergency Action Checklist

- Volume 1, Section 1.1, “Emergency Action Checklist”

C.1.3 Reporting and Notification

- Volume 1, Section 1.2, “Reporting and Notification”
- Volume 1, Section 1.2.3, “Government Reporting Requirements”
- Volume 1, Section 1.2.2, “Emergency Contacts”

C.1.4 Safety

- Volume 1, Section 1.3, “Safety”

C.1.5 Communications

- Volume 1, Section 1.4, “Communications”

C.1.6 Deployment Strategies

- Volume 1, Section 1.5, “Deployment Strategies”

C.1.6.1 Transportation to the Spill Site

- Volume 1, Section 1.5.2, “Transportation”

C.1.7 Response Action Contractor Mobilization

- Volume 1, Section 1.5.3, “Procedures to Notify and Mobilize Response Action Contractors”

C.1.8 Response Strategies

- Volume 2, Scenarios

C.1.8.1 Procedures to Stop the Discharge

- Volume 1, Section 1.6.1, “Procedures to Stop Discharge and Spread”

C.1.8.2 Fire Prevention and Control

- Volume 1, Section 1.6.2, “Methods to Prevent or Control Potential Fire Hazards”

C.1.8.3 Blowout Control

- Not Applicable

C.1.8.4 Discharge Tracking

- Volume 1, Section 1.6.3, “Real-Time Surveillance and Tracking of Spill to Water and Land”

C.1.8.5 Protection of Environmentally Sensitive Areas

- Volume 1, Section 1.6.4, “Methods to Exclude Spill from Sensitive Areas”
- Volume 1, Section 3.2, “Receiving Environment”
- *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*

C.1.8.6 Containment and Control Strategies

- Volume 1, Section 1.6.5, “Containment and Control Actions”
- Volume 3, Section 4.1 “Containment and Exclusion”

C.1.8.7 Recovery Strategies

- Volume 3, Section4.3, “Recovery Strategies”

C.1.8.8 Damaged Tank Transfer and Storage

- Volume 3, Section 4.4, “Damaged Storage Tank Transfer Procedures”

C.1.8.9 Recovered Oil Transfer and Storage

- Volume 3, Section 4.5, “Recovered Oil Transfer, Storage, and Disposal”

C.1.8.10 Temporary Storage and Ultimate Disposal

- Volume 3, Section 4.5, “Recovered Oil Transfer, Storage, and Disposal”

C.1.8.11 Wildlife Protection

- Volume 1, Section 1.6.9, “Wildlife Response Plan”

C.1.8.12 Shoreline Clean-Up Plan

- Volume 1, Section 1.6.10, “Shoreline Response Plans”

C.1.9 Non-Mechanical Response Options

- Volume 1, Section 1.7, “Non-Mechanical Response Options”

C.1.10 Facility or Vessel Description

- Volume 1, Section 1.8, “Facility Diagrams”
- Volume 1, Section 3.1, “Facility Description and Operational Overview”

C.2 Prevention Plan

C.2.1 Prevention Programs in Place

C.2.1.1 Prevention Training Programs

- Volume 1, Section 2.1.1, “Prevention and Operations Training Programs”

C.2.1.2 Substance Abuse Programs

- Volume 1, Section 2.1.2, “Substance Abuse Programs”

C.2.1.3 Medical Monitoring Programs

- Volume 1, Section 2.1.3, “Medical Monitoring Programs”

C.2.1.4 Security Program

- Volume 1, Section 2.1.4, “Security Programs”

C.2.1.5 Transfer Procedures

- Volume 1, Section 3.1.15, “Transfer Procedures”
- Volume 1, Section 2.1.5, “Transfer Procedures”

C.2.1.6 Oil Storage Tanks

- Volume 1, Section 2.1.6, “Oil Tanks”

C.2.1.7 Description of Secondary Containment Areas

- Volume 1, Section 2.1.7, “Description of Secondary Containment Areas” 4
- Volume 1, Section 3.1.3, “Secondary Containment and Drainage”

C.2.1.8 Corrosion Control and Leak Detection

- Volume 1, Section 3.1.9, “Corrosion Monitoring and Deformation Program”
- Volume 1, Section 3.1.10, “Leak Detection”
- Volume 1, Section 2.1.8, “Piping Corrosion Control and Leak Detection Program”
- Volume 1, Section 2.1.8.3.2, “On-Line Leak Detection”

C.2.1.9 Emergency Tow and Escort Vessel Programs

- Not Applicable

C.2.1.10 Vessel Inspection and Maintenance Programs

- Not Applicable

C.2.1.11 Crude Oil Transmission Pipelines

- Volume 1, Section 3.1, “Facility Description and Operational Overview”
- Volume 1, Section 2.6, “Exemptions Applied to Response Planning Standards”
- Volume 1, Section 2.1.11, “Summary of Regulatory Requirements for Prevention Measures”

C.2.2 Discharge History

C.2.3 Potential Discharge Analysis

- Volume 1, Section 2.3, “Potential Discharge Analysis”

C.2.4 Conditions That Might Increase Risk of a Discharge

- Volume 1, Section 2.4, “Conditions Increasing Risk of a Discharge”

C.2.5 Existing and Proposed Discharge Detection

- Volume 1, Section 2.5, “Discharge Detection for Crude Oil Pipelines and Pump Stations”
- Volume 1, Section 2.1.8.3.1, “Visual Observations”

C.2.5.1 Discharge Detection for New Storage Tanks

- Not Applicable

C.2.5.2 Discharge Detection for Existing Installations

- Volume 1, Section 2.1.8.3, “Pipeline Leak Detection”
- Volume 1, Section 2.5, “Discharge Detection for Crude Oil Pipelines and Pump Stations”
- Volume 1, Section 2.1.8.3.2, “On-Line Leak Detection”

C.2.5.3 Discharge Detection for Facility Piping

- Volume 1, Section 2.1.8, “Piping Corrosion Control and Leak Detection Program”
- Volume 1, Section 2.5, “Discharge Detection for Crude Oil Pipelines and Pump Stations”

C.2.5.4 Discharge Detection for Vessels

- Not Applicable

C.2.5.5 Discharge Detection for Crude Oil Transmission Pipelines

- Volume 1, Section 2.5, “Discharge Detection for Crude Oil Pipelines and Pump Stations”
- Volume 1, Section 2.1.8.3.2, “On-Line Leak Detection”

C.2.6 Exceptions Applied to Response Planning Standards

- Volume 1, Section 2.6, “Exemptions Applied to Response Planning Standards”

C.2.7 Compliance Schedule and Waivers

- Volume 1, Section 2.7, “Compliance Schedule and Waivers”

C.3 Supplemental Information

- Volume 1, Section 3, “Supplemental Information”

C.3.1 Facility Description and Operational Overview

- Volume 1, Section 3.1, “Facility Description and Operational Overview”

C.3.1.1 Oil Storage Container Information

- Volume 1, Section 3.1.2, “Crude Oil Breakout and Product Tanks”

C.3.1.2 Types and Amounts of Oil

- Volume 1, Section 3.1.12, “Type and Amount of Oil”

C.3.1.3 Vessel Routes

- Not Applicable

C.3.1.4 Vessel Plans and Diagrams

- Not Applicable

C.3.1.5 Transfer Procedures

- Volume 1, Section 3.1.15, “Transfer Procedures”

C.3.1.6 Production Facility Description

- Volume 1, Section 3.1.4, “Pump Station Support Systems”
- Volume 1, Section 3.1.5, “Pump Station Crude Oil Movement”
- Volume 1, Section 3.1.6, “Pressure Relief Systems”

C.3.1.7 Disposal of Oily Wastes for Vessels

- Not Applicable

C.3.1.8 Additional Information

- Not Applicable

C.3.2 Receiving Environment

- Volume 1, Section 3.2, “Receiving Environment”

C.3.2.1 Potential Routes of Discharge

- Volume 1, Section 3.2.1, “Potential Routes of Discharge”

C.3.2.2 Estimate of Planning Standard to Reach Open Water

- Volume 1, Section 3.2.2, “Estimate of Response Planning Standard (RPS) to Reach Open Water”

C.3.3 Command System

- Volume 1, Section 3.3, “Incident Command System”

C.3.4 Realistic Maximum Response Operating Limitations

- Volume 1, Section 3.4, “Realistic Maximum Response Operating Limitations”

C.3.4.1 General Adverse Weather Conditions

- Volume 1, Section 3.4.1, “Climate Matrixes”

C.3.4.2 Sea States, Tides, and Currents

- Volume 1, Section 3.4.1, “Climate Matrixes”

C.3.4.3 Ice and Debris

- Volume 1, Section 3.4.1, “Climate Matrixes”

C.3.4.4 Hours of Light

- Volume 1, Section 3.4.1, “Climate Matrixes”

C.3.4.5 Miscellaneous

- Volume 1, Section 3.4.1, “Climate Matrixes”
- Volume 1, Section 3.4.2, “Operating Limitations”

C.3.5 Logistical Support

- Volume 1, Section 3.5, “Logistical Support”

C.3.6 Response Equipment

- Volume 1, Section 3.6, “Response Equipment”
- Volume 3, Section 4.3.4, “Sorbents”
- Volume 3, Section 4.3.5, “Accessibility”
- Volume 3, Section 4.3.6, “Cleanup Techniques”
- Volume 1, Section 3.6, “Response Equipment”
- Volume 3, Section 4.3.2, “Response Equipment”
- Volume 3, Section 5, “Containment Site Deployment Tactics”

C.3.6.1 Locations, Inventory, and Ownership of Equipment

- Volume 1, Section 3.6, “Response Equipment”
- Volume 3, Section 4.3.2, “Response Equipment”

C.3.6.2 Time Frame for Delivery and Start Up

- Volume 1, Section 1.5, “Deployment Strategies”
- Volume 1, Section 1.5.5, “Mobilization and Response Times”

C.3.6.3 Manufacturers’ Rated Capacities

- Volume 1, Section 3.6, “Response Equipment”

C.3.6.4 Each Vessel Designated for Oil Recovery Operations

- Volume 3, Section 4.3, “Recovery Strategies”
- Volume 3, Section 5, “Containment Site Deployment Tactics.
- Volume 1, Section 3.6, “Response Equipment”

C.3.6.5 Information on Additional Vessels

- Not Applicable

C.3.6.6 Transfer, Temporary Storage, and Lightering Equipment

- Volume 3, Section 4.4, “Damaged Storage Tank Transfer Procedures”
- Volume, Section 4.5, “Recovered Oil Transfer, Storage, and Disposal”

C.3.6.7 Equipment Storage and Maintenance

- Volume 1, Section3.6, “Response Equipment”

C.3.7 Non-Mechanical Response Information

- Volume 1, Section 3.7, “Non-Mechanical Response Information”
- Volume 1, Section 1.7, “Non-Mechanical Response Options”

C.3.7.1 Specific Mechanisms

- Volume 1, Section 3.7.1, “In-Situ Bioremediation”
- Volume 1, Section 1.7.2 “In-Situ Bioremediation”
- Volume 1, Section 3.7.2, “In-Situ Burning”
- Volume 1, Section 1.7.3, “In-Situ Burning”

C.3.7.2 Inventory of Non-Mechanical Response Equipment

- Volume 1, Section 3.7.3, “Inventory of Non-Mechanical Response Equipment”

C.3.7.3 Necessary Approvals and Applications

- Volume 1, Section 1.7.3.3, “Approval Process”

C.3.7.4 Permits, Approvals, and Authorizations

- Volume 1, Section1.7.3.3, “Approval Process”

C.3.7.5 Plan for Protecting Environmentally Sensitive Areas

- Volume 1, Section 3.7.5, “Plan for Protecting Environmentally Sensitive Areas”

C.3.8 Response Contractor Information

- Volume 1, Section 3.8, “Primary Response Contractor Information”

C.3.9 Training

- Volume 1, Section 3.9, “Oil Spill Training and Exercise Programs”
- Volume 1, Section 2.1.1, “Prevention and Operations Training Programs”

C.3.10 Protection of Environmentally Sensitive Areas

- Volume 1, Section 1.6.4, “Methods to Exclude Spill from Sensitive Areas”
- Volume 3, Section 3, “Containment Actions”
- Volume 3, Section 4.1, “Containment and Exclusion”
- *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*

C.3.10.1 Seasonal and Physical Constraints

- Volume 1, Section 3.4.1, “Climate Matrixes”
- Volume 3, Section 2, “Reconnaissance Action”
- *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*

C.3.10.2 Seasonal and Toxicity Effects

- Volume 1, Section1.6.9.2, “Effects and Persistence of Discharge in Environmentally Sensitive Areas”

C.3.10.3 Geomorphological Effects

- Volume 1, Section 1.6.4, “Method to Exclude Spill from Sensitive Areas”
- Volume 3, Section 2, “Reconnaissance Action”
- *EA-119, Environmental Atlas of the Trans Alaska Pipeline System*

C.3.11 Additional Information

- Not Applicable

C.3.12 Bibliography

- Volume 1, Section 3.12, “Bibliography”

TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

Volume 2
Scenarios

CP-35-1

Alyeska pipeline SERVICE COMPANY



TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

Volume 2
Scenarios

CP-35-1

Alyeska pipeline SERVICE COMPANY

Revision History

Approved by: **John Baldridge**, *Senior. Director Pipeline Operations*

Document Title	Document Number	
Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan *Scenarios Volume*	*CP-35-1 Volume 2*	
Current Revision Features	**Ed. 2, Rev. 2**	**August 28, 2014**
Approval to publish Routine Amendment, Government Letter 31069 **Government Letter 30375: Minor Miscellaneous Edits** Updates made to response contractor for helicopter services in Scenario 2.		
Revision Features	**Ed. 2, Rev. 1**	**June 16, 2014**
Approval to publish Routine Amendment, Government Letter 30391 **Government Letter 30144: Response Trailer Amendment** This revision request reflects changes to oil spill response trailers. Each 32-foot trailer has been replaced with both a 26-foot summer and 26-foot winter trailer. Scenario 2 was updated to correctly identify Pump Station 1 on pages 2-2 through 2-4.		
Revision Features	**Ed. 2, Rev. 0**	**December 21, 2011**
Approval to publish Government Letter 24796. Initial issue of Volume 2, Edition 2, Revision 0.		
Revision Features	**Ed. 1, Rev. 2**	**October 23, 2008**
Approval to publish Government Letter 17106. PS03 Post SR Amendment Submitted on GL 13473 Scenario 3: Revised entire scenario. Scenario 14: Updated Table MAXD.3.		
Revision Features	**Ed. 1, Rev. 1**	**December 18, 2007**
Approval to publish Government Letter 14156. Routine amendments to the following section: Scenarios 11 – 14: Updated fire truck/fire foam information for Glennallen Response Base. (GL 13179)		

Revision Features	Ed. 1, Rev. 0	January 30, 2007
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Introduction

This section presents 14 separate scenarios that have been prepared in accordance with 18 AAC 75.425(e)(1)(F) to illustrate hypothetical responses to spills that could occur along the Trans Alaska Pipeline System (TAPS). The scenarios describe equipment, personnel, strategies, and tactics for planning purposes only and are neither a performance standard indication nor a guarantee of performance.

The environmental conditions collectively described in the scenarios are based on statistically average winter, spring, summer, and fall conditions of winds, currents, snow cover, temperatures, and hours of light and dark. If the environmental conditions change in a scenario, the corresponding outcome will change. The ranges of environmental conditions and their possible effects on oil spill response activities are described in Volume 1, Section 3.4, “Realistic Maximum Response Operating Limitations.”

These scenarios cover a full range of spill sources, products, terrain conditions, and seasonal influences on response actions. The purpose of these scenarios is to illustrate the implementation of response strategies and supporting tactics within the framework of a tiered response organization. These scenarios also demonstrate how resources would be mobilized and allocated in the event of an oil spill.

Spill response operations are tailored to each actual event to reflect the conditions at the time of the spill. Priorities are established by the Incident Commander.

SCENARIO DEVELOPMENT

In recognition of the fact that a response strategy must be tailored to an incident, Alyeska has developed a flexible, multi-faceted response capability that can be applied to on-water and land spills throughout the year. During scenario development, it is important to show the strategies and tactics necessary in each specific scenario. It is also important to show how each specific requirement of the regulation is met. Many of the strategic decisions, and some tactical decisions, made in a response are detailed throughout the plan. Rather than repeat decisions in each applicable scenario, cross-reference tables and potential tactics to be used for each scenario are provided in this section.

Certain terms related to responders are prevalent in the scenarios. Mutual Aid refers to the Mutual Aid Agreement between Alyeska and the North Slope operators such as BP Exploration (Alaska) Inc. and ConocoPhillips Alaska Inc. Baseline contractor is a response action contractor (RAC) who provides call-up contracted personnel to support Alyeska’s internal oil spill responders. CCI Industrial Services, LLC (CCI) is referenced and is contracted through a direct contract with Alyeska.

TABLE 1 SCENARIO SUMMARY

Scenario Name	Location	Volume (barrels)	Time of Year	Contingency Area/Segment
Scenario 1 – Minton Creek/Salcha River Scenario	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	July	Salcha River, Segment 5
Scenario 2 – Pump Station 1 Tank Spill Scenario			July	Putuligayuk River, Segment 1
Scenario 3 – Sag River			June	Sag River, Segment 2
Scenario 4 – Dietrich River			February	Dietrich River, Segment 3
Scenario 5 – Prospect Creek			April	Jim River, Segment 7
Scenario 6 – Pump Station 5 Tank Spill			May	Jim River, Segment 7
Scenario 7 – Fed Creek/North Fork Ray River			July	Ray River, Segment 1
Scenario 8 – Yukon River Winter			January	Yukon River, Segment 4
Scenario 9 – Yukon River Summer			June	Yukon River, Segment 2
Scenario 10 – Pump Station 9 Drag Reducing Agent (DRA) Tank			June	Tatalina River, Segment 6
Scenario 11 – (b) (7)(F),			November	Dry Creek, Segment 1
Scenario 12 – Gulkana			August	Gu kana River, Segment 1
Scenario 13 – Little Tonsina			October	Little Tonsina, River Segment 4
Scenario 14 – Maximum Discharge			Winter	Tazlina River, Segment 1

TABLE 2 TACTICAL DESCRIPTIONS

Scenario Reference	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Tactics Descriptions for Spills On Land (OL) to Water (OW) *(Volume in barrels)*	(b) (7)(F), (b) (3)													
Dams														
OL: Blocking Dams	X				X									
OW: Underflow Dams or MegaSecur Dams	X	X					X		X		X			
Berms (Dikes)														
OW: Diversion Berms	X				X		X	X	X		X	X		X
OW: Overflow Berms (weirs)	X													
OL: Berms Built On Land	X	X			X	X	X	X	X	X	X	X		X
Culvert Blocking														
OL: Earthern Materials, Sandbags, Sheets of Plywood, or Snow	X	X			X	X	X	X	X		X		X	X
OW: Underflow Device, Pump, or Siphon	X	X	X		X	X	X		X		X		X	
Interception Barriers														
OL: Trenches	X	X		X	X	X		X	X	X		X		X
OL: Sheet Barriers	X				X	X		X	X					X
Booming														
OW: Block-Flow Booms	X	X	X		X	X	X		X		X	X	X	
OW: Diversion Booms	X	X	X		X	X	X		X		X	X	X	
OL: Collection Areas and Diversion Pits	X	X	X	X	X	X	X		X	X	X	X	X	X
Sorbents / Trash Fences														
OL: Sorbents	X				X			X	X					X
OW: Trash Fences	X				X				X					
Remediation														
In Situ Burning			X											
Thermal Remediation				X			X						X	

Scenario 1. Minton Creek/Salcha River

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from a structural failure of a longitudinal weld.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures MCSR.1 and MCSR.2)
3. Timeline matrix (Table MCSR.1)
4. On-site resource tally sheet (Table MCSR.2)
5. Response organization charts (Figures MCSR.3 through MCSR.7)
6. Resource mobilization tables (Tables MCSR.3 through MCSR.7)
7. Summary of oil fate and estimated recovery table (Table MCSR.8)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the site location and a deployment map that shows containment site, task force, and staging area locations (Figures MCSR.1 and MCSR.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table MCSR.1). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table MCSR.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures MCSR.3 through MCSR.7). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables MCSR.3 through MCSR.7). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table MCSR.8).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 1 – MINTON CREEK/SALCHA RIVER 51,599-Barrel Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3) crude oil The response planning standard volume for a spill from a section of aboveground pipe at PLMP 509.8 caused by a structural failure of longitudinal weld is calculated as shown in the Introduction Section of *CP-35-1 Volume 1* using the equation from 18 AAC 75.436.

Source

The leak occurs in a section of aboveground pipe. The failure occurs at the 3 o'clock position on the pipe.

Environmental Conditions

Time	1100	**Wind**	8 mph from E
Season	Summer – July 15	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	75ºF
Visibility	No precipitation	**Tide/Current**	Minton Creek-1.5 feet per second (fps) McCoy Creek-1-2 fps Salcha River-3 fps

Environmental Considerations – Salcha River Contingency Area, Segment 5

The Salcha River is an important anadromous fish stream containing Chum, Chinook and Coho salmon. It is considered critical habitat and is sensitive all year because of spawning, incubation, and rearing of salmon and other species. Minton and McCoy Creeks are intermittent grayling streams.

Birds (gulls/ravens) and beaver (by evidence of beaver dams) could be in the area.

Assumptions

1. A structural failure occurs in a longitudinal pipeline weld, spilling oil on land and eventually to water.
2. Pipeline fail-safe controls operate properly.
3. Oil drains completely from pipeline by T + 4.

SCENARIO 1 – MINTON CREEK/SALCHA RIVER
51,599-Barrel Spill on Land to Water

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1.1	Construct a Mega-secur Water Dam and use catenary boom, and use loader to construct a berm to contain oil at containment site (CS) 8-8 and immediate surrounding area.	Volume 2, Table MCSR.3
Volume 3, Section 4.1.1	Construct Mega-secur Water Dam and use catenary and diversion boom to establish initial containment along Minton Creek and upper reaches of McCoy Creek (CS8-8A).	Volume 2, Table MCSR.4
Volume 3, Section 4.1.1	Installation of additional containment and recovery operations along Minton Creek, McCoy Creek, and Salcha River include construction of an Mega-secur Water Dam and recovery of spilled oil will be by use of multiple pumps, skimmers, portable oil containers.	Volume 2, Table MCSR.5
Volume 3, Section 4.1.1	Use diversionary boom and exclusion boom to establish containment and recovery operations at CS8-7A, Salcha River, and McCoy Creek Confluence. A skimmer and open top tank are used for recovery operations.	Volume 2, Table MCSR.6

Support Action Taken

Notification is made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table MCSR.1).

Actions

Actions are based on the above noted notifications, a number of simultaneous response actions begin.

1. The pipeline is shut in. Remote gate valves (RGVs) 77A and 80 are closed.
2. The Delta Response Base Response Base Supervisor (RBS) requests Fairbanks Response Base to complete an initial assessment of the spill by Fairbanks based helicopter, and radio the information to the Delta Response Base.
3. Safety and security measures are initiated.
4. The Delta Response Base RBS assumes the position of Initial Incident Commander and the regional Oil Spill Response Coordinator (OC) assumes the position of Operations Section Chief. As soon as is practicable, the RBS transfers the Incident Commander position to a member of the Fairbanks IMT and the OC transitions to the position of Deputy Operations Section Chief. The Emergency Operations Center is set up in Fairbanks (FEOC) and the Mobile Command Post is setup in the vicinity of the scene.

SCENARIO 1 – MINTON CREEK/SALCHA RIVER
51,599-Barrel Spill on Land to Water

5. Requests are made for the following resources to report (by radio or in-person) to the staging area at the Salcha River Campground and the undeveloped Salcha River Camping Area, and then deploy to the following locations:

   All available response personnel from the Delta Response Base (5-person team – Task Force- [TF] 1) respond to Rosa Ridge at approximately pipeline (b) (7)(F), (b) (3) set up a staging area, and deploy to the source of the spill at Minton Creek and to CS8-8 by the Glennallen Response Base/PS11 helicopter.

   A 7-person response crew (TF-2) from the Fairbanks Response Base responds to the Salcha River Campground/boat launch, sets up a staging area, and deploys to a beaver dam, 2+ miles downstream of the spill site and to CS8-8A.

   Two responders from Fairbanks Response Base and 5 responders from Glennallen Response Base (TF-3) are mobilized to the Salcha River Campground/boat launch staging area for deployment by Fairbanks helicopter to CS8-9 .

6. One Yukon Response Base P&CM, 3-person crew of Yukon Village responders, 3-person baseline contractors and 1 Alyeska Pipeline Service Company (APSC) responder from Fairbanks Response Base (TF-4) deploy to CS8-7A.

7. Baseline contractor is requested to call up 10 off-duty responders for night shift operations on Day 1. The Ship Escort/Response Vessel System (SERVS) 8-person response team, the Ahtna 7-person response team, the Alaska Clean Seas (ACS) 10-person response team, and baseline contractor management are notified and requested to begin mobilizing personnel to Fairbanks Response Base for dispatch to the spill site on Day 2. Baseline contractor is requested to recall all off-duty response personnel and to notify the labor unions for call-out of additional personnel for both day and night shifts. The Fairbanks IMT is notified and assembled, and makes preparations to assume overall command of the incident operating from the Fairbanks Emergency Operations Center. The Mobile Command Post is dispatched to the scene with the "Go Team" to provide support services. The Fairbanks IMT Personnel Unit Leader begins notifying linewide off-duty pump station personnel and recalls them to Fairbanks for dispatch to the spill site.

Oil Trajectory

The initial outflow of oil cuts a hole in the ground on the south side of the pipeline and a channel under the pipeline across the workpad and east toward Minton Creek.

The direct line of sight distance from the pipeline to the Salcha River is approximately 8 miles. It is estimated that the total combined stream flow course distance between the pipeline point of release and the Salcha River is 24 miles. Unimpeded oil flow will reach the Salcha River in approximately 19.8 hours from the point of release.

Oil pools to a depth of approximately 12 inches over an acre of ground on both sides of the pipeline. Following the flow path of the oil, another acre of ground is covered to a depth of approximately 6 inches, and extending along the flow path, another acre of ground is covered to a depth of approximately 3 inches. The oil will settle into pockets and slowly spread outward over approximately another 2 acres. Oil retained on land from this release is estimated to be 14,574 barrels.

(Hole = 1,000 barrels; 1 acre at 12-inch depth = 7,757 barrels; 1 acre at 6-inch depth = 3,878 barrels; and 1 acre at 3-inch depth = 1,939 barrels.)

Oil flowing toward Minton Creek along the workpad will reach a low water crossing where it will flow directly into Minton Creek. Minton Creek is a slow-moving stream with a velocity of approximately 1.5 feet per second (fps).

The oil will flow along Minton Creek to the north before intersecting McCoy Creek. McCoy Creek's flow velocity is 1-2 fps. Based on the estimated distance to McCoy Creek (9 miles) and velocity of Minton Creek, the unimpeded oil flow would reach McCoy Creek in approximately 8.8 hours.

Once it reaches McCoy Creek, flowing at a velocity of 2 fps for 15 miles, the oil (unimpeded) would take approximately another 11 hours to reach the Salcha River.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment",* or other tactics determined by Operations to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

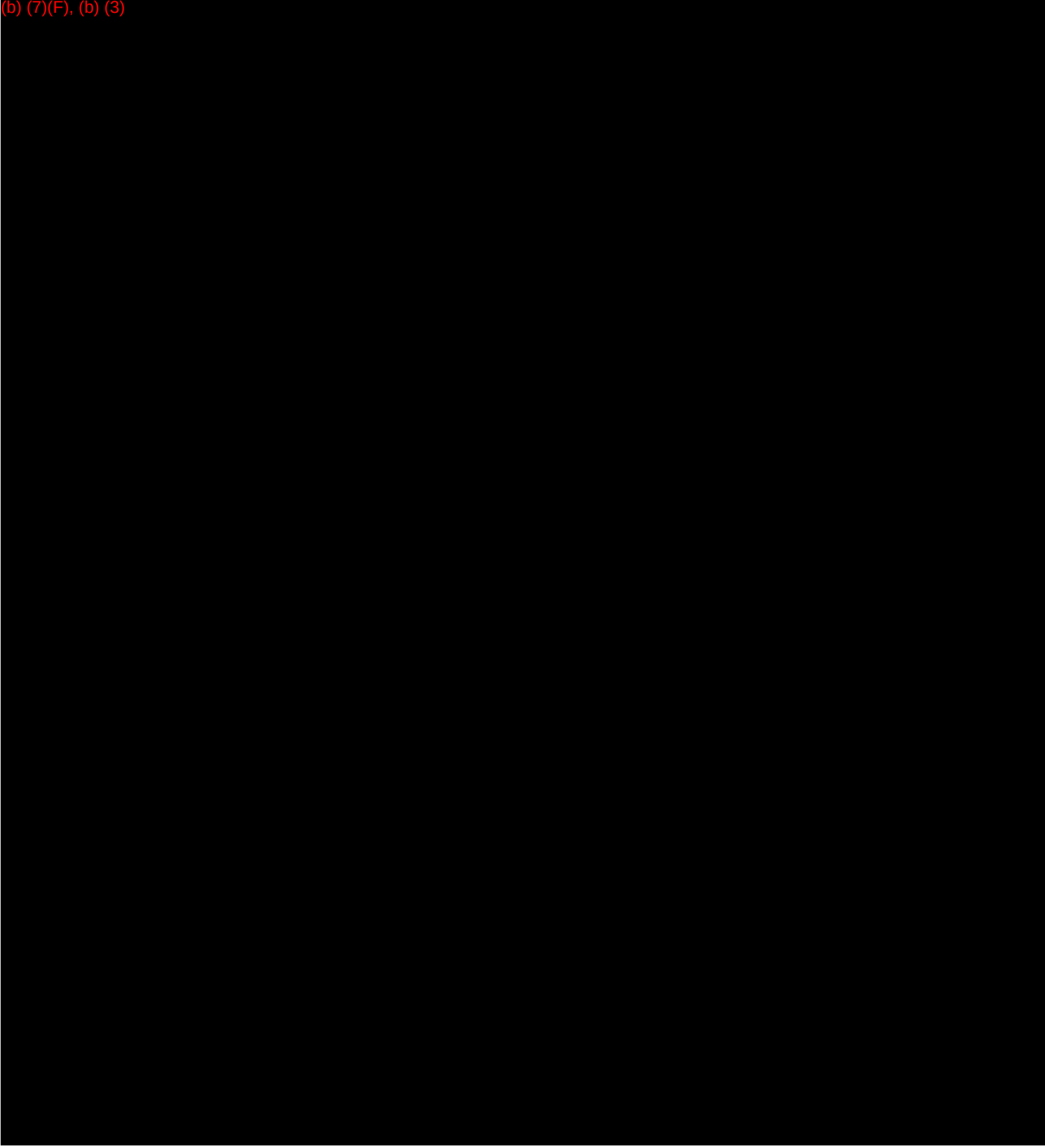


FIGURE MCSR.1
MINTON CREEK/SALCHA RIVER SCENARIO MAP

(b) (7)(F), (b) (3)

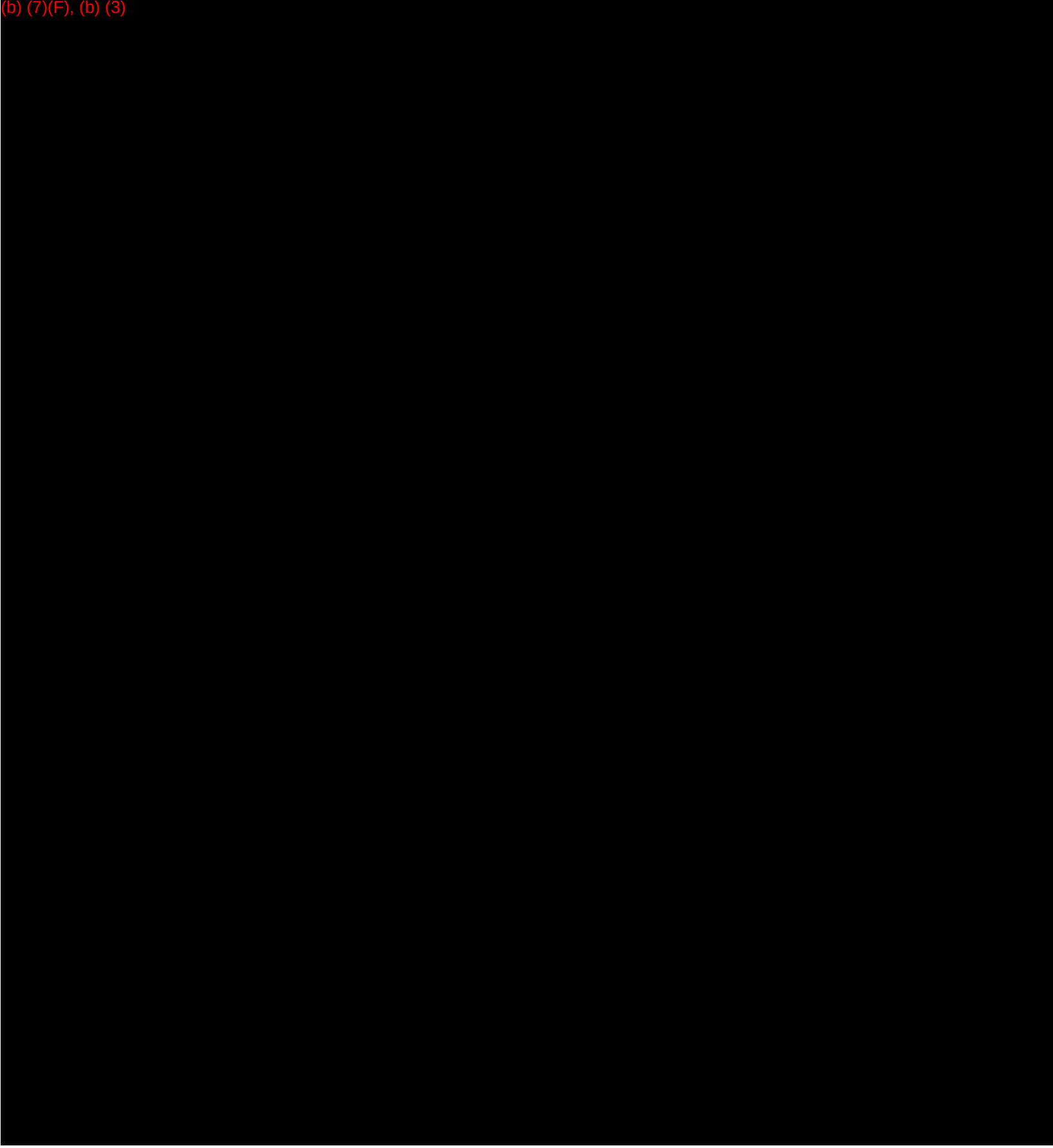


FIGURE MCSR.2
MINTON CREEK SCENARIO DEPLOYMENT MAP

TABLE MCSR.1 MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Situation/Status • **Weather** • **Environmental**	Summer season. Winds from east at 8 mph. Temperature 75 ºF.	Oil retained on land is estimated at 14,574 barrels over 3 acres. Initial oil outflow cuts a hole in the ground where 1,000 barrels pool. Then 7,757 barrels spread to a depth of 12 inches, 3,878 barrels spread to a depth of 6 inches, and 1,939 barrels spread to a depth of 3 inches, each covering an acre of ground. The oil settles into pockets and slowly spreads outward over approximately another 2 acres.	Oil flowing toward Minton Creek along the work pad reaches a low water crossing where it flows directly into Minton Creek. Minton Creek is slow-moving, with an approximate velocity of 1.5 feet per second (fps). Minton Creek is a small, narrow stream with an incised channel. There are several beaver dams and dead fall logs across Minton Creek. Vegetation along the stream bank consists of heavy brush, black spruce, and interspersed white spruce. The oil in the damaged segment of pipeline drains completely by Hour 4.	The oil flows north along Minton Creek before intersecting McCoy Creek. McCoy Creek is generally 10 to 20 feet wide with some areas up to 40 feet wide. Vegetation along the stream banks is similar to Minton Creek. McCoy Creek also has several beaver dams and dead fall logs across its channel.	McCoy Creek's flow velocity is 1-2 fps. Estimating the distance to McCoy Creek (9 miles) and velocity of Minton Creek, unimpeded oil flow reaches McCoy Creek by approximately Hour 8.8. Minton Creek and McCoy Creek flow channels meander over relatively flat terrain with almost continuous horseshoe bends, and double back to flow toward the Salcha River.
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site security: safety, site control, surveillance.	Control site access, evacuate nonessential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, and develop and implement leading edge tracking.			
	Cleanup and countermeasures on land.	Investigate cause; stop source if safe. Contain on land if possible; use settlement ponds. Prepare for shutdown; redirect oil flow away from facilities.			
	Cleanup and countermeasures on water.	Deploy task forces; mobilize resources to maximize containment and recovery. Contain as near to pipeline as possible. Initiate free oil recovery beyond primary containment areas (Minton Creek and Salcha River). Track oil movements.			
	Protection of sensitive resources and wildlife.	Protect anadromous fish and grayling streams. Initiate ESA identification and prioritization process. The Salcha River is an important anadromous fish stream.			
	Stakeholder communications and engagement.	The following State and Federal agencies are notified by Operations Control Center (OCC): Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy.			
Fire Prevention, Control, and Safety	The Delta Response Base RBS requests Fairbanks Response Base to complete an initial assessment of the spill by Fairbanks helicopter. The responder brings air monitoring equipment and completes an initial site safety assessment. The information is radioed to the Incident Commander and used to verify that all responders have appropriate personal protective equipment (PPE) before entering the spill site.	Safety: Upon arrival from Fairbanks at 1300 hours, the Safety Officer conducts a site safety analysis using the "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. In addition, safety objectives for other areas of the response, such as air operations, ground transportation, and boat handling on the Salcha River, are also addressed. To facilitate the transportation of personnel from the scene to their lodgings, dry decontamination will be done at the spill site. Dry decontamination will consist of the removal and disposal of PPE, initial boot wipe down, and wash up with waterless skin cleaner.	The Valdez firefighters arrive with the Fairbanks fire foam skid at T + 4 hours.		

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Fire Prevention, Control, and Safety (Continued)		Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL exceeds 20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck, wheeled 150-lb extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires using high volume handlines. The primary mission of firefighters is personnel safety and protection. A 2-person firefighting team is mobilized by the Valdez helicopter to Delta Response Base, where they pick up the fire foam skid mobilized from the Fairbanks Response Base and mobilize it to the spill site. Upon arrival, the Valdez helicopter is staged at Salcha Campground.			
Discharge Tracking	The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by air, on the ground, or both. Aerial tracking is done visually by helicopter. On the ground, tracking is done by containment and recovery operations personnel who establish the extent of spread of the spilled oil. In the initial response, tracking reports are made to the incident command center via radio on an hourly basis at least. As the containment and recovery operation is established and the risk of spread is reduced, reports are provided less frequently.	Incident Commander tracks discharge on a situation status map. Tracking reports will be made to the Incident Command Center via radio on an hourly basis at least.	All of the oil in pipeline segment flows out by Hour 4.		As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently. Oil will flow directly to Minton Creek and reach McCoy Creek in approximately 8.8 hours (at approximately 2000 hours). Unimpeded oil will reach Salcha River in approximately 11 hours (at approximately 0700).
Protection of Environmentally Sensitive Areas (ESAs)	The On-Scene Incident Commander identifies the priority objective as containment of oil before it reaches the Salcha River.				

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Response Actions	OCC received a low-pressure alarm and PS09 went down on low suction pressure at 1100, causing the line to be shut down. The Delta Response Base RBS requests Fairbanks Response Base to complete an initial assessment of the spill by Fairbanks helicopter and radio the information to Delta Response Base. The responder also completes an initial site safety assessment as descr bed above. This is completed by T + 1 hour. OCC contacts the Fairbanks Duty Officer. The Duty Officer notifies the Fairbanks Senior Vice President and the Pipeline Manager. The regional OC assumes the position of Initial Incident Commander and the Delta Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks and the Mobile Command Post is set up in the vicinity of the scene. The SERVS eight-person response team, the Ahtna seven-person response team, the ACS ten-person response team, and baseline contractor management are notified and requested to begin mobilizing personnel to Fairbanks for dispatch to the spill site. Baseline contractor is requested to recall all off-duty response personnel and to notify the labor unions for call-out of additional personnel for long-term spill response for both day and night shifts. The Fairbanks IMT is notified and assembled. The IMT makes preparations to assume overall command of the incident, operating from the Fairbanks Emergency Operations Center. The Fairbanks IMT Personnel Unit Leader begins notifying line-wide off-duty pump station personnel and recalls them to Fairbanks for dispatch to the spill site.	OCC: Federal and State agencies are notified (ADEC, NRC, BLM, and ADNR). Containment and recovery task force personnel submit tracking reports to the Incident Command Center via radio on an hourly basis. Communication support equipment such as portable radio repeaters will be deployed to support the message traffic between the task forces and the On-Scene Command group. Initial response message traffic will be relayed using response vehicle radios positioned at high points near the release point. Portable radio repeater sets will be deployed within 12 hours of the initial response according to the Incident Action Plan. Communications Plan developed for the second shift. The minimum number of portable repeaters is one set for this area. Two more portable repeaters may be needed depending on actual deployment locations of containment and recovery sites or staging areas.			

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Staging Areas Mobilization	Staging areas are established at the Salcha River Campground and the undeveloped Salcha River Camping Area, and (b) (7)(F), . The following resources are mobilized: • All available response personnel from Delta Response Base (a 5-person team [TF-1]) respond to approximately (b) (7)(F), , set up a staging area, and deploy to the source of the spill at Minton Creek and to CS8-8 by the Glennallen Response Base/PS11 helicopter by T + 3 hr. • A 7-person crew from Fairbanks Response Base (TF-2) responds to the Salcha River Campground/boat launch, sets up a staging area, and deploys to a beaver dam 2+ miles downstream of the spill site and to CS8-8A. • 2 responders from Fairbanks Response Base and 5 responders from Glennallen Response Base (TF-3) are mobilized to the Salcha River Campground and the undeveloped Salcha River Camping Area, staging area for remote deployment by helicopter (Fairbanks helicopter) to CS8-9 (Team 1 [3 people] and Team 2 [four people]). • 1 P&CM plus 3-person crew of Yukon Response Base responders as well as 3-person baseline contractors and 1 APSC from Fairbanks Response Base (TF-4) mobilize to CS8-7A. • IMT requests ACS to mobilize 10 responders from the North Slope, and baseline contractor to mobilize 10 off-duty responders from Fairbanks Response Base to provide night shift personnel. • The Mobile Command Post and "Go Team" are mobilized. • The Safety Officer and Environmental Generalist are mobilized. • Alyeska Central Warehouse (ACW) Staging Area Managers are dispatched to the Salcha River Campground and the undeveloped Salcha River Camping Area, to manage staging areas. • Delta Response Base sends personnel to manage staging area. • The Valdez helicopter arrives at staging after dropping Valdez fire personnel at Delta Response Base.				
Response Actions **Task Force 1**	Staging area (b) (7)(F), is designated to support TF-1. 5-person response crew is mobilized from Delta Response Base by road to (b) (7) . Glennallen Response Base/PS11 helicopter is mobilized.	Response crew arrives with initial response equipment shown in Table MCSR.3 at staging area at (b) (7)(F), and is flown by Glennallen Response Base/PS11 helicopter to the source of the spill and to CS8-8 by T + 3 hr.	Low water crossing (LWC) of work pad dammed and two 24-inch culverts installed and blocked to contain oil and accommodate vehicles on work pad. Begin construction of berm with dozer on the Minton Creek side of the pipeline to limit oil spread and flow into Minton Creek Recovery equipment and tankage arrive on site.	Recovery of product begins at the blocked LWC within T + 6 hours into portable tankage. Work continues to construct and increase the height of the perimeter containment berm and to line the berm. Berm construction completed at T+5.5 hr. Recovery pumps are strategically placed to recover product into portable tankage.	Vac trucks arrive on site at T + 12 hours to transport recovered product. At the constructed berm, recovery of product into portable tanks begins within T + 12 hours. ROW has been bladed out from Staging area to allow tanker trucks access to spill site at T + 9 hours. Tanker arrives at spill site for product transfer at T + 12 hours. 5 baseline contractor responders arrive and take over the night shift.

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Response Actions **Task Force 2** **(Fairbanks)**	A 7-person response team is mobilized from Fairbanks Response Base. The first group of 3 responders is transported by Fairbanks helicopter along with the safety responder to the spill site. One of the responders conducts reconnaissance and radios the information to Delta Response Base RBS. The responder identifies a beaver dam 2+ miles downstream of spill as potential containment site for TF-2. The 3 responders then deploy to this location by T + 1. The remaining responders mobilize by road to the staging area at PLMP (b) with initial equipment shown in Table MCSR.4.	The 3 responders in TF-2 transported by Fairbanks helicopter are deployed at Minton Creek by T + 1. TF-2 establishes containment site at beaver dam 2+ miles downstream of Minton Creek. A landing zone is cleared to deploy equipment at site at T +2 hours. Staging Area PLMP 513.5 is designated to support TF-2.	Installation of Mega-secur Water Dam, boom placement, and lining of beaver dams and deadfall logs. The remaining responders, recovery equipment, and tankage (Table MCSR.4) arrive on site.	Tankage (Table MCSR.4) continues to arrive on site for recovery efforts. TF-2 starts setting up skimmers and tankage at multiple locations.	Installation of Mega-secur Water Dam and boom placement at lining of beaver dams and deadfall logs is complete at T + 8 hours. Skimmers are deployed and product is recovered into portable tankage at T + 9 hours. Second and third containment booms deployed within close proximity downstream for additional containment and recovery T + 10 hours. Additional tankage (Table MCSR.4) continues to arrive on site. Initial oil recovery operations begin at stream containment locations along Minton Creek and the upper reaches of McCoy Creek, using six Aquaguard skimmers and two Komara skimmers to allow for a combined skimming capacity of 14,532 gallons per hour. 7 ACS responders arrive and take over night shift.
Response Actions **Task Force 3** **(Fairbanks and Glennallen)**	Two responders from Fairbanks Response Base and four responders from Glennallen Response Base are notified and mobilized to the Salcha River Campground staging area.	TF-3 Fairbanks responders and equipment arrive at the Salcha River Campground staging area.	Fairbanks personnel and equipment mobilized to CS8-9 by one of the helicopters by T + 4 hours. Begin construction of Mega-secur Water Dam below containment site CS8-9.	Glennallen personnel arrive at staging area and fly by helicopter to CS8-9 by T + 6 hours. Skimmers and portable tankage are in place and operational at T + 8 hours. Construction of Mega-secur Water Dam is complete at 8+ hours. CS8-9 containment boom in place at T + 8 hours. Recovery of oil begins as a sufficient amount of oil reaches the site for recovery. Portable pumps, skimmers, and temporary storage tanks/bladders will be set up for recovery operations and operated at the containment sites with the most oil accumulation first along Minton Creek, McCoy Creek, and Salcha River. Other containment sites will be equipped with recovery equipment as soon as the equipment is available in the staging area. Equipment and materials ordered for recovery operations come from Alyeska-owned equipment stockpiles located at pump stations and in Valdez and ACS on the North Slope. Equipment and materials are transported by truck and delivered to the staging area. A helicopter is used to transport equipment from the staging area to containment and recovery points along Minton Creek and McCoy Creek. Additional oil recovery operations in these areas will begin at approximately T + 8 hours and resources will be added to through T + 18 hours. Three additional Manta Ray skimmers, one Komara skimmer, three Aquaguard, and three Desmi 250 skimmers will be used for recovery at the additional containment sites at Minton Creek, McCoy Creek, and Salcha River. The Manta Ray skimmers have a derated capacity of 24 gallons per minute (gpm) (120 gpm x 0.2) for each unit. The Komara skimmers have a derated capacity of 22.6 gpm for each unit. The Desmi 250 skimmers have a derated capacity of 88 gpm (440 gpm x 0.2) for each unit. The Aquaguard skimmers have a derated capacity of 33 gpm. As the initially placed open top tanks, bladders, and skid tanks become full, additional storage containers would be placed at those sites to allow continued oil recovery. With the employment of these additional skimmers, oil recovery increases to 32,718 gallons per hour. The equipment and personnel requirements for this aspect of the response are listed in Table MCSR.5. 5 baseline contractor responders arrive and take over night shift.	

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Response Actions **Task Force 4**	The Yukon Response Base P&CM, 3-person crew of Yukon Village responders, 3-person baseline contractors and 1 Alyeska Pipeline Service Company (APSC) responder from Fairbanks Response Base are assigned to TF-4 to deploy CS8-7A.	Salcha River Campground is identified as the staging area to support TF-4. Four responders (baseline contractor and APSC) and equipment are mobilized to Salcha River Campground staging area.	Four responders (baseline contractor and APSC) and two boats arrive at staging area at T + 3 hours and prepare to launch boats. Four responders (Yukon Response Base P&CM (and Yukon Village responders) arrive at staging at T + 5 hours.	TF-4 loads equipment (Table MCSR.6) into boats. The airboat and riverboat are launched from the public boat launch facility where the Richardson Highway crosses the Salcha River. The boats are loaded with boom pallets and the decontamination unit. It is approximately 24 river miles to CS8-7A from the boat launch area. It takes one hour to launch and load the boats. Another two hours are required to transit to CS8-7A.	The first equipment and manpower arrive on the site at T + 8 hours. Two booms are deployed on McCoy Creek upstream of the confluence with the Salcha River. Additionally, two sets of fire boom are deployed immediately downstream of this area. The booms are deployed to drive oil to a sandbar. This work is completed at T + 12 hours. Once containment boom has been put in place, additional equipment (Table MCSR.6) necessary for recovery and storage are transported to the site. Establishment of this containment site (CS8-7A), recovery equipment, and fire boom is defensive in nature. While oil is not expected to reach this location, these actions would be taken as a step to further restrict the possible flow of oil into the Salcha River and downstream points. 3 ACS arrive and take over night shift.
Recovered Oil Hauling and Storage **Task Force 5**	Arrangements are made to recover and transport oil using vac trucks. K&W/Carlile Trucking is requested to stage two 10,000-gallon road tankers at pipeline access 49-APL-2 to receive recovered oil from the vac trucks.	Temporary storage identified as Crude Relief Tank 190 at PS09 with a capacity of 30,185 barrels. Additional storage available with bladders and tank trucks.	An estimated 18,500 barrels of oil is contained at CS8-8 and immediate surrounding area (on land and water). Vac and tanker trucks begin mobilizing.	Initial containment sites along Minton Creek and the upper reaches of McCoy Creek are estimated to contain approximately 34,025 barrels of oil.	Vac trucks and tanker trucks arrive on site. K&W/Carlile Trucking and vac trucks being transporting and discharging recovered oil into Tank 190 at PS09. Oil is held for reinjection into the pipeline as it becomes operational again. Oil emulsification is assumed to be no more than 10 percent in the initial 10 hours of on-water recovery operations. Decanting of recovered water back to Minton and McCoy Creeks is accomplished by gravity-draining water from a tank or bladder bottom fitting via a hose and discharging the clear water back to the stream at a location upstream of containment and the recovery device. Oil and emulsified oil will be retained.
Waste Management **Task Force 6**		Solid waste will be segregated and placed into clear bags. Waste will be segregated as follows: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area in an old material site on Rosa Ridge (PLMP 512.6). This soil will be thermally remediated on site.	As the spread of oil is secured, the transport of recovered oil and oily debris will become an added focus of the Incident Action Plan.		

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Wildlife Protection/ Rehabilitation **Task Force 7**	The Wildlife Protection and Rehabilitation Plan is activated (also see Protection of ESAs above). Environment Unit takes the following steps: • CCI is requested to provide ten wildlife hazers to work under the supervision of the Environment Unit hazing team leaders. CCI begins mobilizing to the spill site. • CCI is contacted to activate the wildlife treatment center stationed at Fairbanks.		Environment Unit contacts ACS and SERVS, which are placed on standby for the poss ble use of their wildlife response facilities or provision of additional hazing and/or capture and treatment equipment.	Environment Unit contacts the International Bird Rescue Research Center (IBRRC) out of Berkeley, California, which is requested to mobilize a full-scale hazing operation as well as a capture and stabilization operation. This includes making the Anchorage wildlife facility operational. CCI wildlife hazers arrive on site with wildlife treatment center.	

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 19-31) Day 2 (0600-1800)	Night Shift (Hour 31-43) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)
Situation/Status • **Weather** • **Environmental**	Upon reaching McCoy Creek at Hour 8, unimpeded oil flow at a velocity of 2 fps for 15 miles takes approximately 11 hours to reach the Salcha River (about Hour 20).					
Objectives and Strategies[1]	**Objectives**	**Strategies**	**Objectives**	**Strategies**		
	Site security: safety, site control, surveillance.	Control site access, evacuate nonessential exposed personnel, review initial safety assessment, and revise site safety plan as hazards change.	Site security: safety, site control, surveillance.	Control site access, evacuate nonessential exposed personnel, review initial safety assessment, and revise site safety plan as hazards change.		
	Cleanup and countermeasures on land.	Assure containment integrity. Initiate active oil recovery from pond systems. Develop runoff control plan.	Cleanup and countermeasures.	Continue maintaining all containment. Maximize recovery. Maximize waste management.		
	Cleanup and countermeasures on water.	Maintain near Pipeline containment and recovery. Actively pursue oil outside containment.	Protection of sensitive resources and wildlife.	Maintain ESA protections and wildlife protection and rehabilitation.		
	Protection of sensitive resources and wildlife.	Maintain ESA protections. Execute wildlife rehabilitation. Deploy Bird rehabilitation center.	Stakeholder communications and engagement.	Continue JIC, joint press releases, and conference schedule.		
	Stakeholder communications and engagement.	Continue JIC, joint press releases, and conference schedule.	Operations continuity.	Schedule oil movement resumption away from response operations.		
Fire Prevention, Control, and Safety	Continue to support response.	Safety: redo site assessments as conditions and operations change. Continue monitoring as access areas are opened up. Set up additional personnel decontamination stations. Continue to support response.	Safety: continue monitoring and maintain safety roles. Continue to support response.	Continue to support response.	Continue to support response.	Continue to support response.
Discharge Tracking	Tracking reports will be made to the Incident Command Center via radio on an hourly basis at least.					
Protection of Environmentally Sensitive Areas (ESAs)						
Response Actions **Task Force 1**	TF-1 continue to recover product into portable tanks and transfer into tanker trucks. Additional personnel decontamination stations are set up using the decon wash van that arrives from Fairbanks Response Base at T + 24 hr. SERVS 8-person crew arrives to support TF-1.	TF-1continue to recover product into portable tanks and transfer into Tanker trucks.	As LEL drops to permissible limits for personnel to enter contained areas above berming, small irrigation channels are constructed to increase accumulation of product saturated in vegetative mat to collection points.	More irrigation ditches are constructed to increase accumulation of product. Minivacs or similar systems are deployed to collect smaller deposits of oil throughout vegetative mat.		

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 19-31) Day 2 (0600-1800)	Night Shift (Hour 31-43) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)
Response Actions **Task Force 2**	TF-2 continues to recover product. Additional tankage and bladders are dispatched to handle the accumulation of product. TF-2 uses a combination of portable pipeline, hoses and pumps to transport product to Pipeline ROW for transport by tankers. ACS 10-person crew arrives to support TF-2	TF-2continues to construct and procure equipment to build pipeline to ROW.	Pipeline is completed and transfer of product to ROW begins.	Product continues to be transferred to ROW into tankers.	Product transfer from storage tanks to ROW is complete.	
Recovered Oil Transfer and Storage **Task Force 5**	Oil emulsification is assumed to be no more than 20 percent in 20 hours of on-water recovery operations. Vac trucks, vac units, and pump systems recover free oil on ponds. Recovered oil is temporarily stored on land. Ahtna 7-person crew arrives to support TF-5.	Oil emulsification is assumed to be no more than 30 percent through Hour 72 of on-water recovery operations.	Oil emulsification for on-land recovery locations is assumed to be 0 percent. To expedite the movement of recovered oil from the multiple recovery locations, a temporary pipeline constructed of hoses, pumps, and skid tanks will be laid alongside Minton and McCoy Creeks. Hose in the 3- to 4-inch diameter range will be used. Positive displacement or centrifugal pumps compatible with the discharge and suction hose size requirements will be used. Portable tanks will be located as needed alongside pumps to provide for flow balancing. The hose, pumps, and tanks will be acquired from remaining Alyeska resources, including SERVS, or outside suppliers. Permits for bush clearing and access to the sites through temporary use permitting will be developed through the incident Unified Command processes. The Logistical support equipment selected for use in establishing the system and operation of the system will be chosen to minimize additional environmental impacts. Oil from the temporary pipeline will be injected into the pipeline at PLMP 512.5 and Tank 190.		The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge and recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are used to recover deeper pools of oil when possible. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about 2 weeks, the shoreline cleanup crews recover about one-half of the oil volume estimated onshore following completion of Initial recovery efforts. The initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program.	
Waste Management **Task Force 6**	Order leak-proof dumpsters to store/ship waste. Set up test protocol to test for RCRA status.	As the spread of oil is secured, the transport of recovered oil and oily debris becomes an added focus of the Incident Action Plan.	Continue waste disposal plan. Increase manpower as waste stream volume increases.	Begin consolidation of waste by type. Ensure drainage of waste into liner is addressed to preclude risk of overflow from rain and leak potentials.	Refine waste disposal plan to address in more detail the long-range disposal strategy. Options to dispose of waste include off-site disposal and storage capacities.	Waste management operations continue until complete.
Wildlife Protection/ Rehabilitation **Task Force 7**	Wildlife Hazing and Capture Unit set up. The IBRRC is on location and takes over coordination of the overall wildlife response operation.	Continue hazing/capture.	Minimize wildlife oiling through hazing. Continue hazing/capture.	Minimize wildlife oiling through hazing. Continue hazing/capture.		
Pipeline Repair	Contractor and APSC personnel are mobilized to repair the failed section of pipe.					

TABLE MCSR.1 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 19-31) Day 2 (0600-1800)	Night Shift (Hour 31-43) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)
Shoreline Clean-up Plan	Begin organizing Shoreline Cleanup Assessment Teams (SCAT).		Mobilize SCAT.	Laborers start hand cleaning stream banks.	Over a period of about 2 weeks, the streambank cleanup crews recover about one-half of the oil volume estimated onshore following completion of initial recovery efforts. **SCAT Deployed:** Oil remaining trapped in widely scattered pockets in the on-land area of the initial release will be dealt with during the long-term cleanup. An option for recovering this oil would be to flood the area now contained in earth berms with water to float the oil. The floated oil would be corralled in containment booms and skimmed off the water. During the days that follow, cleanup activities focus on the oil remaining along the shorelines of Minton Creek, McCoy Creek, and other affected drainages. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the SCAT process. Oiled gravel on the work pad is stored in a temporary lined area for later cleaning or incineration and reuse.	

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE MCSR.2 MINTON CREEK/SALCHA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							Hour 3-5 1400-1600						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	–	–	–	–	–	–	2	–	–	–	–	–	–	2	–	–	–	(b)	–	(b)
Discharge Tracking	Aerial Tracking[4]	–	–	–	–	1 helicopter (1)[4]	–	–	–	–	–	–	1 helicopter (1)[4]	–	–	–	–	–	–	1 helicopter (1)[4]	–	(7)	–	(7)
	Ground Tracking[5]	TF-1	–	Note[5]	–	–	–	–	–	–	Note[5]	–	–	–	–	–	–	Note[5]	–	–	–	(F),	–	(F),
Fire Protection	Fire Protection	TF-1	–	–	–	–	–	–	–	–	–	–	Valdez helicopter (1)	–	–	–	–	–	–	Fairbanks fire foam skid (2)	–	(b)	–	(b) (3)
Safety	Site Safety and Control[6]	–	1	1	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	(3)	–	
	Containment at CS8-8	TF-1	–	–	–	–	–	–	–	–	–	–	Glennallen Response Base helicopter (1)	–	–	–	–	5	Berm maintenance: 966-loader (1)[8] 10-yd end dump (1[8]) D-6 cat (1)[8]	4 ea. 20-ft x 24-in culverts Sandbags Mega-Secur Dam 1 tractor/ trailer (1)[8] 2 crew cab trucks (2)[8] Glennallen Response Base/PS11 Helicopter (1)	DA MPLETE B BE R 4 AND HOUR MPLETE B 8,500 BBL			
	Recovery at CS8-8	TF-1	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	
	Containment at Areas of Opportunity Along Minton Creek and McCoy Creek, CS8-8A	TF-2	–	–	–	–	–	–	–	–	7	–	2 Chainsaws decon unit 196-ft fire boom 2K-ft containment boom Fairbanks helicopter (1)	–	–	–	–	7	–	Mega-Secur Dam 2 chainsaws Decon unit 196-ft fire boom 2K-ft contain. Boom Fairbanks helicopter (1)	–		–	
	Recovery at Areas of Opportunity Along Minton Creek and McCoy Creek, CS8-8A	TF-2	–	–	–	–	–	–	–	–	(7, shared with containment)	–	–	–	–	–	–	(2, shared with containment)	–	2-in – 3-in pumps Skimmers: Aquaguard RBS-05 D2 Komara	6 2		Varies	
	Containment at CS8-9	TF3	–	–	–	–	–	–	–	–	–	–		–	–	–	–	2	–	Mega-Secur Dam 4 heli. Sling kits pumps Decon unit helicopter (1) 1K ft containment boom	–		Varies	
	Recovery at CS8-9	TF-3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–		–		–	
	Containment at CS8-7A Salcha River & McCoy Creek Confluence	TF-4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–		–	
	Recovery at CS8-7A Salcha River & McCoy Creek Confluence	TF-4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	
Wildlife	Wildlife Hazing	TF-7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	
On-Scene Comms.	Communication Support	Comms.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	
Mobile Command Post	Incident Support and Communications																							
Personnel Total			Note[7]	3	0	1					17	–	4					19	3	12				
Mechanical Equipment Total					0	1						–	7						3	23				

TABLE MCSR.2 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-7 1600-1800								Hour 7-19 1800-0600							Hour 19+ 0600+						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage[3] No.	Storage[3] Capacity (bbl)	People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage[3] No.	Storage[3] Capacity (bbl)	People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage3 No.	Storage3 Capacity (bbl)
Security	Site Control	Security	2	2	–	–	–	(b)	–	(b) (7)	2	–	–	–	–	–	(b) (7)	2	–	–	–	(b) (7)	–	(b) (7)
Discharge Tracking	Aerial Tracking[4]	DT	–	–	–	1 helicopter (1)[4]	–	(7)	–	(F), (b)	–	–	1 helicopter (1)[4]	–	–	–	(F), (b) (3)	–	–	1 helicopter (1)[4]	–	(F), (b) (3)	–	(F), (b) (3)
	Ground Tracking[5]	DT	–	Note[5]	–	–	–	(F), (b) (3)	–		Note[5]	–	–	–	–	–		Note[5]	–	–	–		–	
Fire Protection	Fire Protection	FP	–	–	–	Fairbanks fire foam skid (2)	–		–		–	–	Fairbanks fire foam skid (2)	–	–	–		–	–	Fairbanks fire foam skid (2)	–		–	
Safety	Site Safety and Control[6]	–	1	1	–	–	–		–		1	–	–	–	–	–		1	–	–	–		–	
	Containment at CS8-8	TF-1	5	5	Berm maintenance: 966-loader (1)[8] 10-yd end (1)[8] dump (1)[8] D-6 cat (1)[8]	4 ea. 20-ft x 24-in culverts sandbags Mega-Secur Dam 1 tractor/ trailer (1)[8] 2 crew cab trucks (2)[8] Glennallen Response Base/PS11 Helicopter (1)	–		Shared with TF-2		5 + 5 night shift	Berm maintenance: 966-loader (1)[8] 10-yd end (1)[8] dump (1)[8] D-6 cat (1)[8]	4ea. 20-ft x 24-ft culverts Sandbags Mega-Secur Dam 1 tractor/ trailer (1)[8] 2 crew cab trucks (2)[8] Glennallen Response Base/PS11 Helicopter (1)	–	–	–		13 + 5 night shift	Berm maintenance: 966-loader (1)[8] 10-yd end (1)[8] dump (1)[8] D-6 cat (1)[8]	4 ea. 20-ft x 24-in culverts Sandbags Mega-Secur Dam 1 tractor/ trailer (1)[8] 2 crew cab trucks (2)[8] Glennallen Response Base/PS11 helicopter (1) Decon wash van	–		–	
	Recovery at CS8-8	TF-1	–	–	–	–	–		–		6		3 vac trucks (6)	–	–	–		6		3 vac trucks (6)	–		–	
	Containment at Areas of Opportunity Along Minton Creek and McCoy Creek, CS8-8A	TF-2	7	7	–	Mega-Secur Dam, decon unit 2 chainsaws 196-ft fire boom 2K-ft containment boom	–		–		7 + 7 night shift	–	Mega-Secur Dam decon unit 2 chainsaws 196 ft fire boom 2K-ft containment boom	DAM & LINING BEAV & DEADFALL L COMPLETE BY H				MS 17 + 7 night shift	–	Mega-Secur Dam 2 Chainsaws Decon unit 196-ft. fire boom 2K-ft containment boom	–		–	
	Recovery at Areas of Opportunity Along Minton Creek and McCoy Creek, CS8-8A	TF-2	–	(7, shared with containment)	–	2-in and 3 in pumps Skimmers: Aquaguard RBS-05 D2 Komara Fairbanks helicopter (1)	6 2		Delta Response Base, Fairbanks Response Base tanks and bladders Line wide tanks		7, shared with containment)	–	2-in and 3-in Pumps Skimmers: Aquaguard RBS-05 D2 Komara Fairbanks helicopter (1)	6 2	47 ea. 32 ea.	Delta Response Base, Fairbanks Response Base tanks and bladders Line wide tanks SERVS tanks ACS tanks		(17, shared with containment)	–	2-in and 3-in Pumps Skimmers: Aquaguard RBS-05 D2 Komara Fairbanks helicopter (1)	6 2		Delta Response Base, Fairbanks Response Base tanks & bladders Line wide tanks SERVS Tanks ACS tanks	
	Containment at CS8-9	TF-3	–	Shared with recovery	–	Mega-Secur Dam 4 heli. Sling kits pumps decon unit helicopter (1) 1K ft containment boom	–		–		Shared with recovery	–	Mega-Secur Dam 4 heli. Sling kits pumps decon unit helicopter (1) 1K ft containment boom Storage Bladders	–	–	–		shared with recovery	–	Mega-Secur Dam 4 heli. Sling kits pumps decon unit helicopter (1) 1K ft containment boom Storage Bladders	–		–	
	Recovery at CS8-9	TF-3	7	7	–	Skimmers: Manta Ray Komara Desmi Aquaguard	3 1 4 3		Delta Response Base, Glennallen Response Base various		7 + 5 night shift	–	Skimmers: Manta Ray Komara Desmi Aquaguard	3 1 4 3	34 ea. 32 ea. 126 ea. 47 ea	Delta Response Base Glennallen Response Base various		15 + 5 night shift	–	Skimmers: Manta Ray Komara Desmi Aquaguard	3 1 4 3		Delta Response Base, Fairbanks Response Base various	
	Containment at CS8-7A Salcha River & McCoy Creek Confluence	TF-4	–	–	–	–	–		–		8 + 3 night shift	–	2 boom pallets portable shelter decon unit 1 riverboat (1)[8] 1 airboat (1)[8] 196 ft fire boom	–	BOOM DEPLOYMENT COMPLETED AT HOUR			18 + 3 night shift	–	2 boom pallets portable shelter decon unit 1 riverboat (1)[8] 1 airboat (1)[8] 196 ft fire boom	–		–	
	Recovery at CS8-7A Salcha River & McCoy Creek Confluence	TF-4	–	–	–	–	–		–			–				Yukon Response Base Open Top Tanks 2 bladders		16	–	Skimmers: TDS 136 skimmer TDS 118 skimmer MI-30 Aquaguard RBS-05 D2	1 2 2 1		Yukon Response Base Open top tanks 2 bladders 2 tanks	
	Hauling of Recovered Oil	TF-5	–	–	–	–	–		–		shared with TF-1	2 tank trucks (4)	2 vac trucks (2) 3 vac trucks (6) shared with TF-1	–	–	–		3 plus others shared with TF-1	2 tank trucks (4)	2 vac trucks (2) 3 vac trucks (6) shared with TF-1	–		–	
Wildlife	Wildlife Hazing	TF-7	10	10 CCI	–	Wildlife treatment center	–		–		10 CCI	–	Wildlife treatment center	–	–	–		10 IBRRC 10 CCI	–	Wildlife treatment center	–		–	
On-Scene Comms.	Communications Support	Comms.	–	–	–	–	–		–		–	–	Up to 3 portable repeaters	–	–	–		–	–	Up to 3 portable repeaters	–		–	
Personnel Total			Note[7]	39	4	9					79	8	25					144	8	18				

TABLE MCSR.2 (CONTINUED) MINTON CREEK/SALCHA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-7 1600-1800								Hour 7-19 1800-0600							Hour 19+ 0600+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage3	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Mechanical Equipment Total					4	34						6	49						6	57				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the “People for Ops” column.

-- Not arrived on site. May be mobilized or en route.

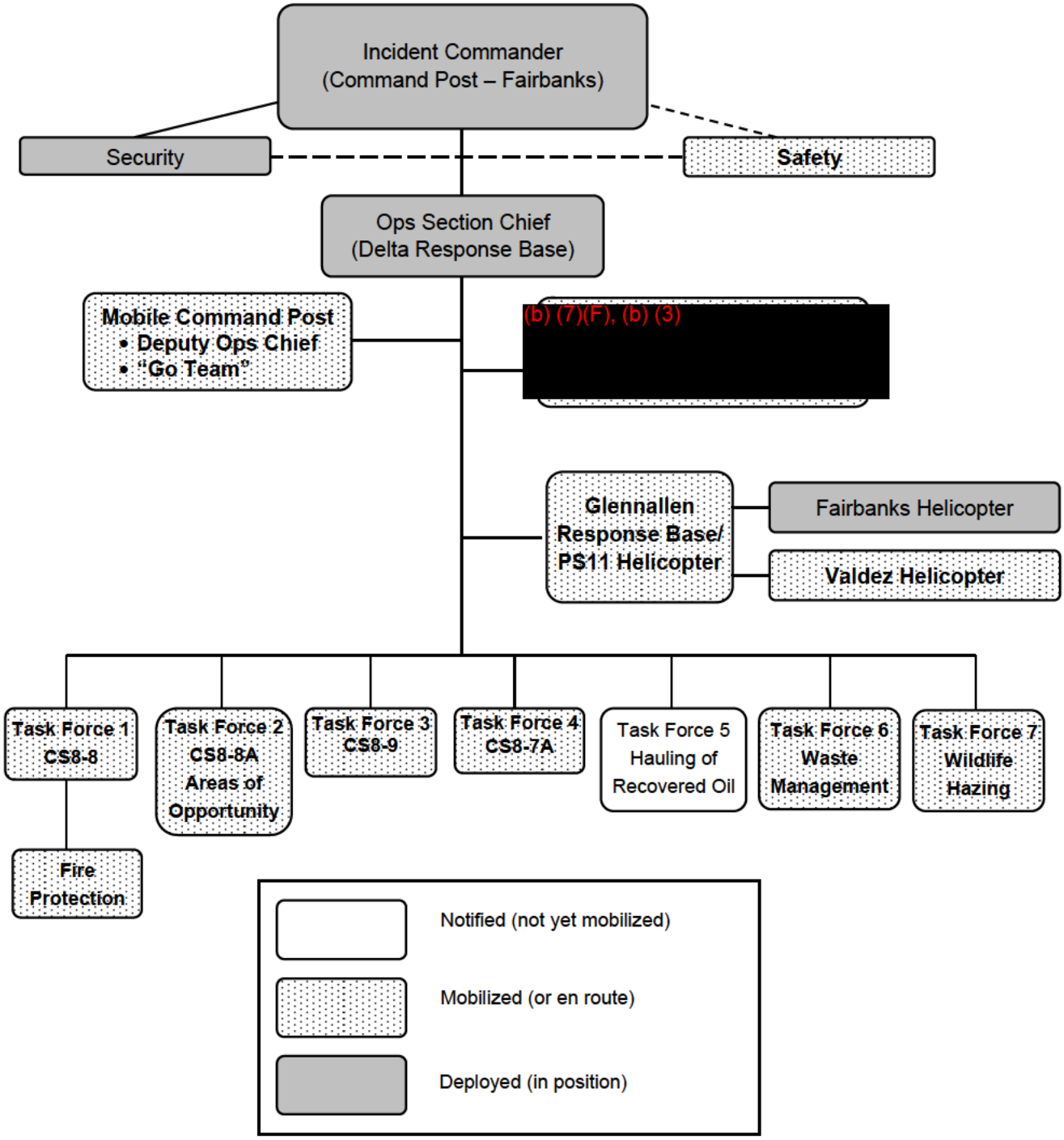


FIGURE MCSR.3
MINTON CREEK/SALCHA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

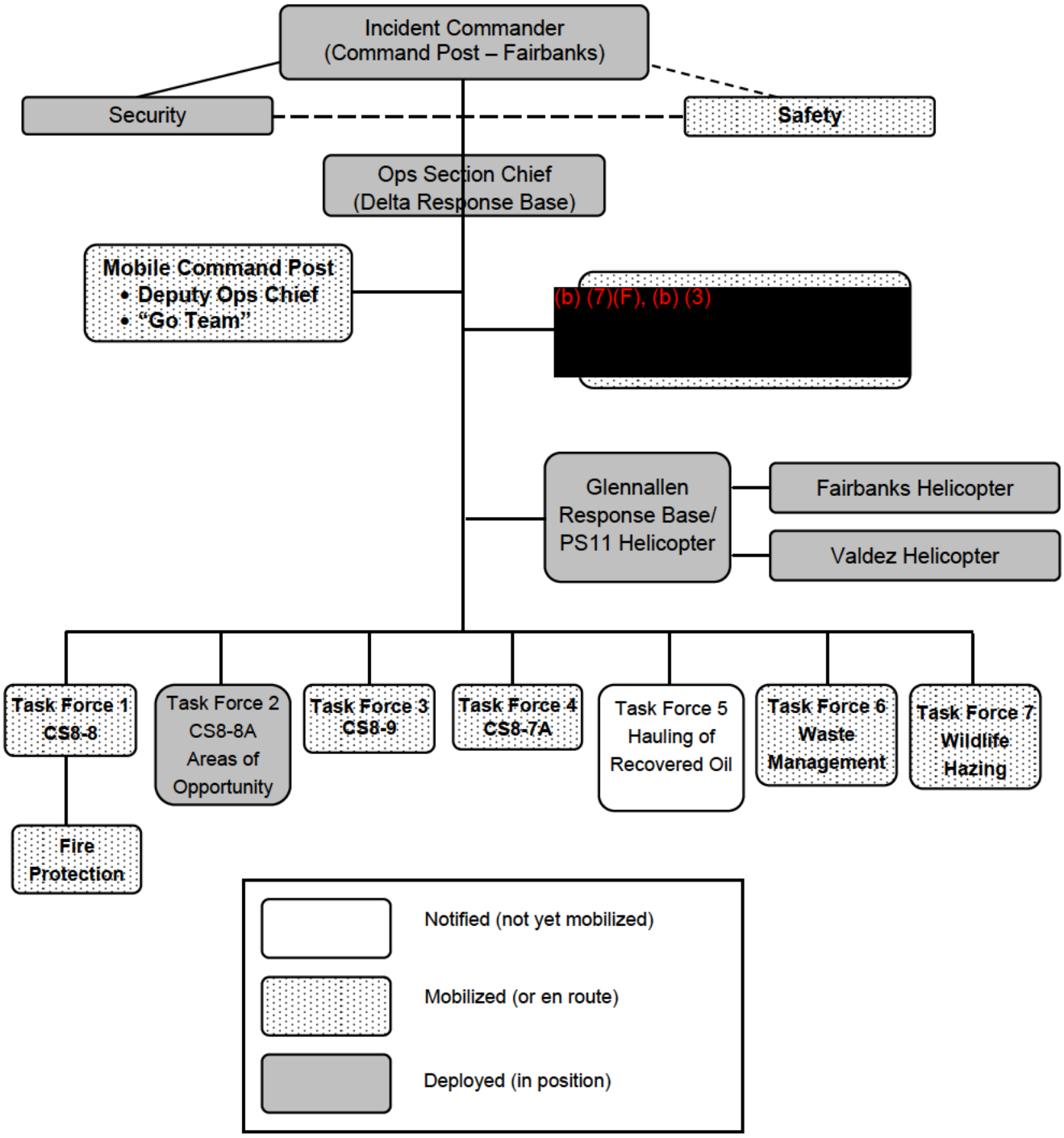


FIGURE MCSR.4
MINTON CREEK/SALCHA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

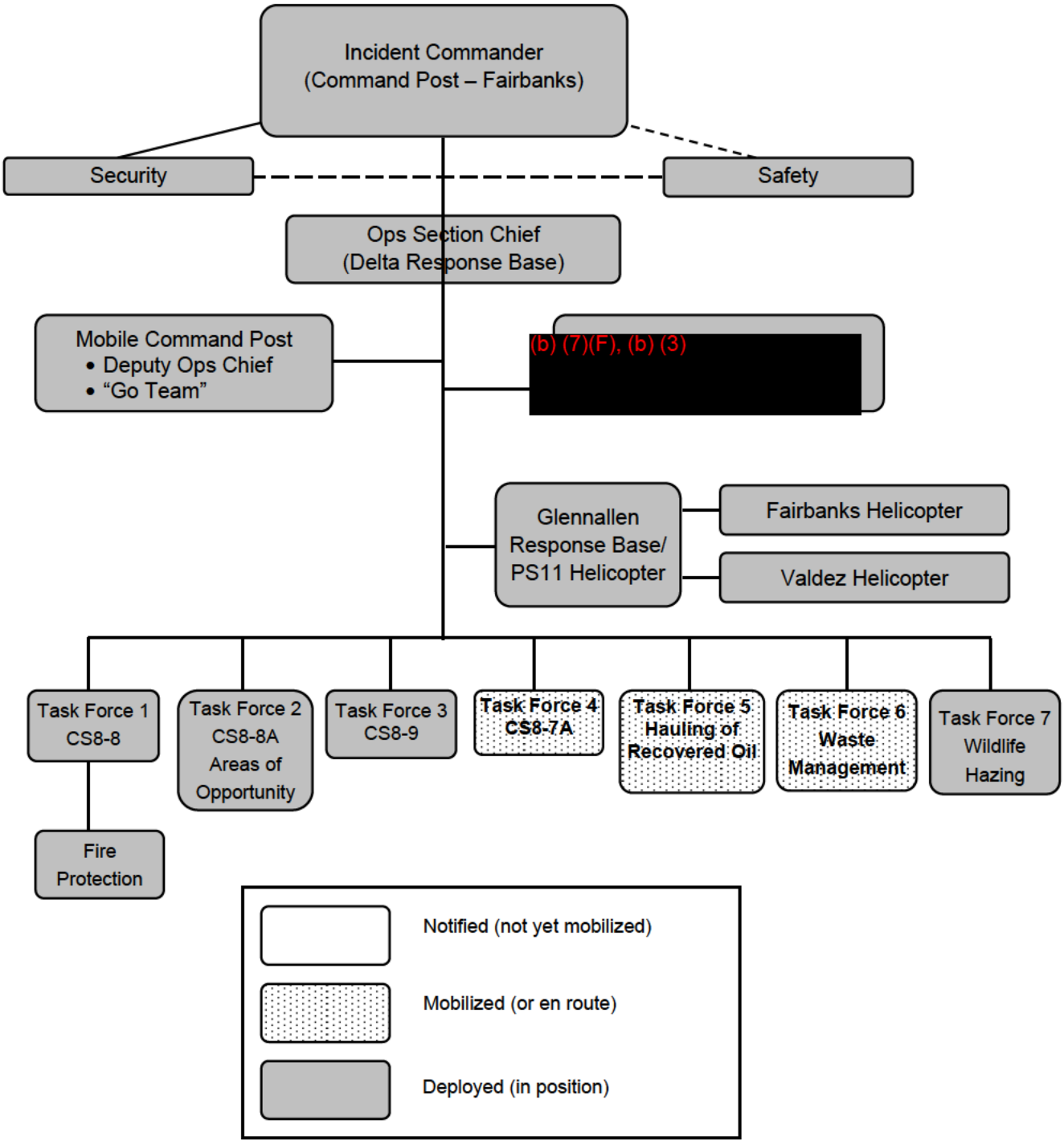


FIGURE MCSR.5
MINTON CREEK/SALCHA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-7

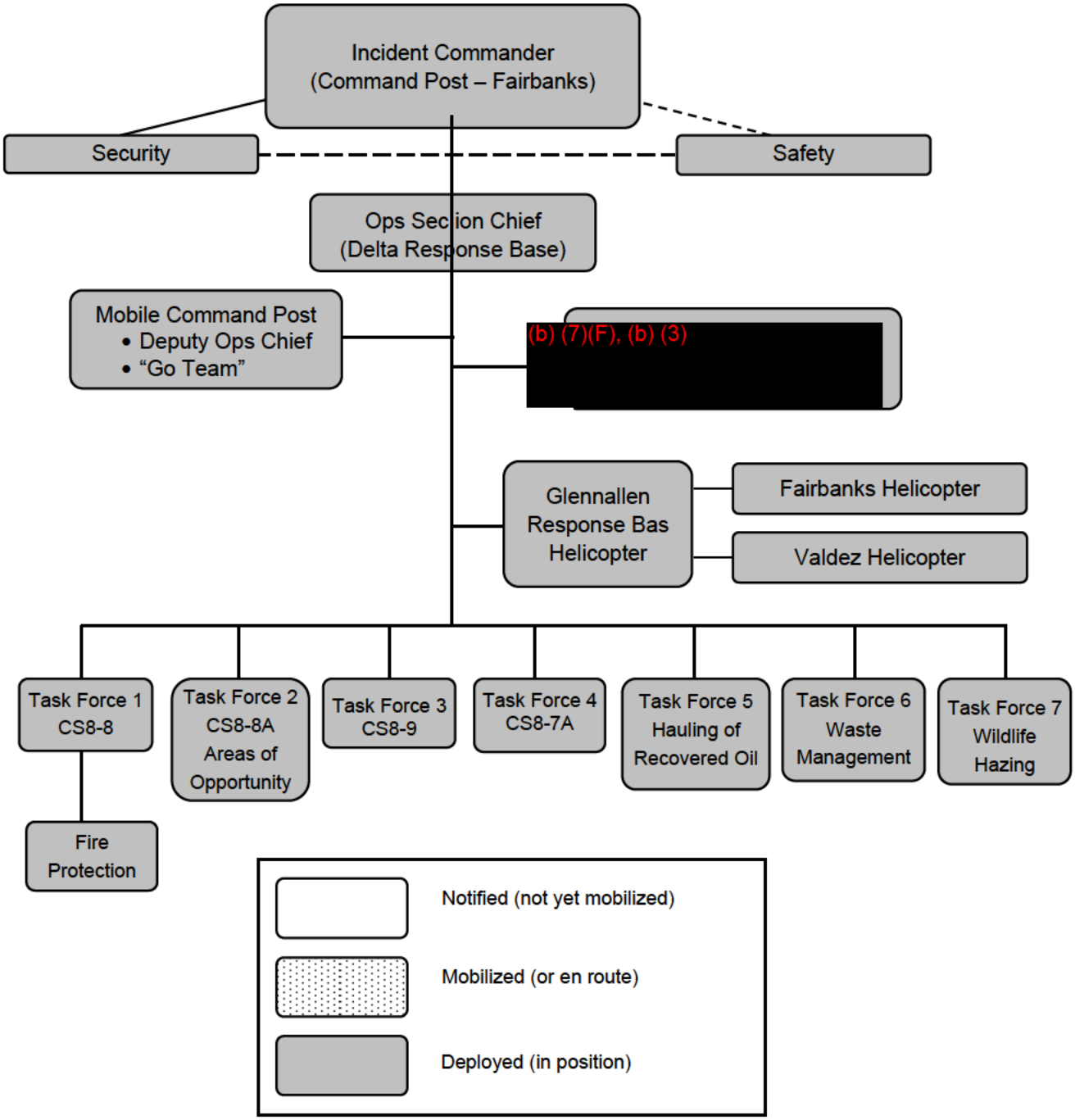


FIGURE MCSR.6
MINTON CREEK/SALCHA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 7-12

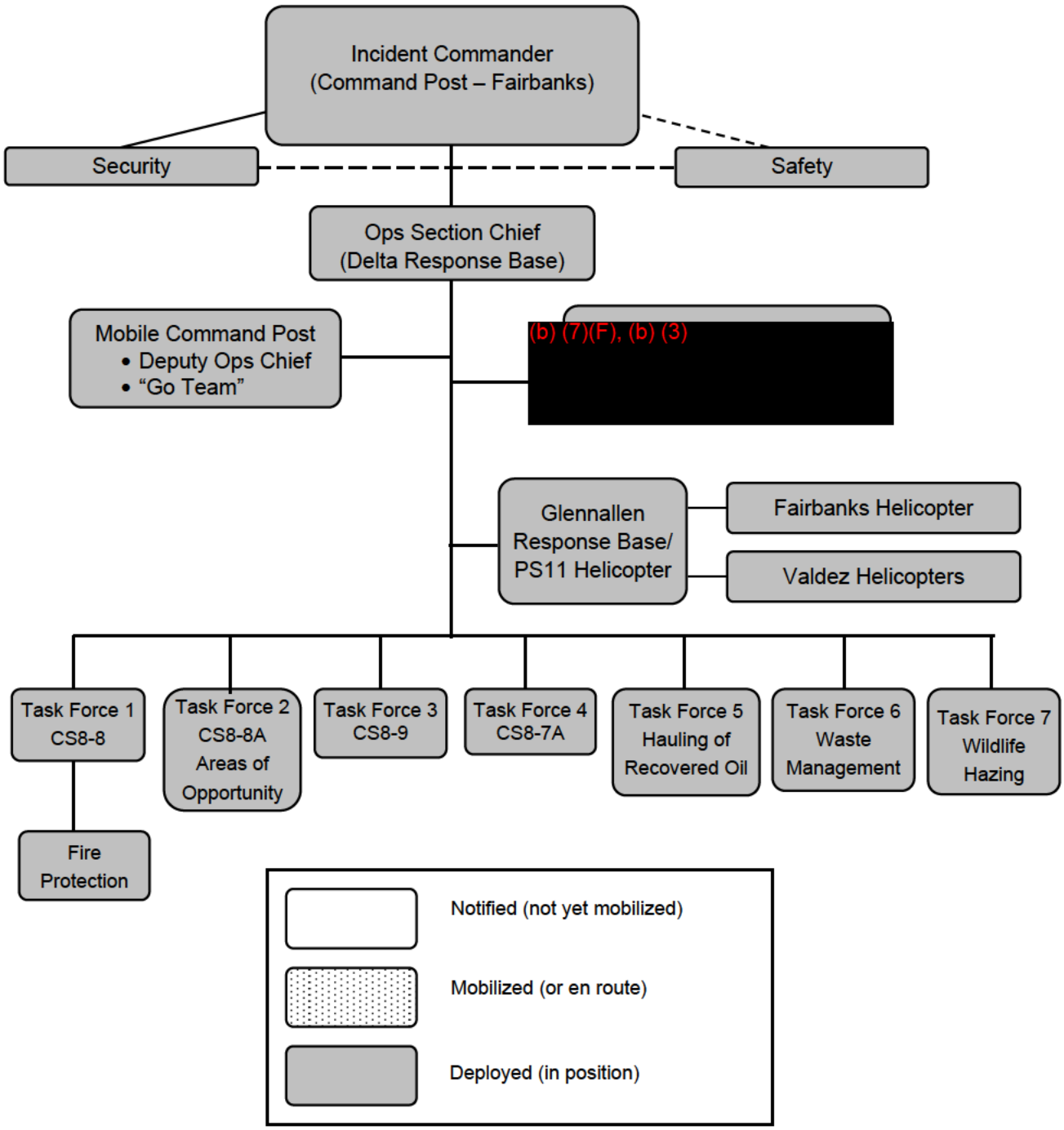


FIGURE MCSR.7
MINTON CREEK/SALCHA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 12-24

TABLE MCSR.3 MINTON CREEK/SALCHA RIVER SCENARIO RESOURCE MOBILIZATION TABLE – CS8-8

Contain Oil at CS8-8			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
966 Loader	Delta Response Base	Loading End Dump	T + 3 hr
10-yard End dump	Delta Response Base	Bring in fill material	T + 3 hr
20-ft x 24-in Culverts (4)	Delta Response Base	Vehicle access	T + 3 hr
5-Person Response Crew (TF-1)	Delta Response Base	Labor	T + 3 hr
Sandbags	Delta Response Base	Culvert blocking	T + 3 hr
D-6 Cat	Delta Response Base	Construction of berm	T + 3 hr
Mega-Secur Dam	Glennallen Response Base	Construction of dam	T + 3 hr
Tractor/trailer	Delta Response Base	Heavy equipment	T + 3 hr
Fire foam skid	Fairbanks Response Base	Contingency	T + 4 hr
2-Person fire fighting crew	Valdez	Contingency	T + 4 hr
Crew cab trucks (2)	Delta Response Base	Transport	T + 3 hr
Helicopter	Glennallen Response Base/PS11	Transport	T + 3 hr
Decon Wash Van	Fairbanks Response Base	Decontamination	T + 24 hr
Recovery Equipment Requirements at CS8-8			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Vac truck	Fairbanks Response Base	Recovery and hauling of recovered oil	T + 12 hr
Vac truck (2)	Delta Response Base and PS10	Recovery and hauling of recovered oil	T + 12 hr
Teamsters – baseline contractor (6)	Fairbanks Response Base	Drivers (2 shifts)	T + 12 hr
Laborers – baseline contractor (6)	Fairbanks Response Base	Assist in loading and unloading (2 shifts)	T + 12 hr
5-person response crew for night shift (baseline contractor)	Fairbanks Response Base	Night shift labor	T + 12 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE MCSR.4 MINTON CREEK/SALCHA RIVER SCENARIO RESOURCE MOBILIZATION TABLE – CS8-8A

Initial Containment and Recovery Operations along Minton Creek and the Upper Reaches of McCoy Creek (CS8-8A)			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Mega-Secur Dam	Fairbanks Response Base	Dam construction	T + 1 hr
Decon unit	Fairbanks Response Base	Decontamination	T + 1 hr
Radio Repeater Set	Fairbanks Response Base	Communication	T + 1 hr
Chainsaws (2)	Fairbanks Response Base	Clear brush	T + 1 hr
2-inch – 3-inch Pumps	Fairbanks Response Base	Oil recovery	T + 3 hr
Aquaguard RBS-05 D2 skimmers (6)	Fairbanks Response Base and Delta Response Base	Oil recovery	T + 3 hr
Komara skimmers (2)	Fairbanks Response Base and Delta Response Base	Oil recovery	T + 4-8 hr
Open top tanks 270,000 gallons	Fairbanks Response Base and Delta Response Base	Oil storage	T + 4-6 hr
Responders (7) (TF-2)	Fairbanks Response Base	Work force	T + 1-3 hr
Fire boom (196 feet)	Fairbanks Response Base	Contingency	T + 3 hr
Helicopters (Air Log)	Fairbanks	Air lift operations	T + 0.5hr
Containment boom (2,000 feet)	Fairbanks Response Base	Containment	T + 3 hr
Open top tanks, skid tanks, bladders 687,000 gallons	Line wide	Oil storage	T + 4-8 hr
Open top tanks, skid tanks, bladders 100,000 gallons	SERVS Valdez	Oil storage	T + 12-16 hr
Open top tanks, skid tanks, bladders 300,000 gallons	ACS North Slope	Oil storage	T + 12-16 hr
7- person response crew for night shift (ACS)	North Slope – ACS	Night shift labor	T + 12 hr

TABLE MCSR.5 MINTON CREEK/SALCHA RIVER SCENARIO RESOURCE MOBILIZATION TABLE – CS8-9

Containment and Recovery Operations at CS8-9			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Mega-Secur Dam	Fairbanks Response Base	Dam construction	T + 3 hr
Storage Containers, various	Fairbanks Response Base and Glennallen Response Base	Oil storage, 79,000 gallons	T + 3-7 hr
Helicopter sling kits (4)	Fairbanks Response Base and Delta Response Base	Air lift equipment	T + 3-7 hr
Manta Ray and pumps (3)	Fairbanks Response Base and Glennallen Response Base	Oil recovery	T + 3-7 hr
Komara skimmers (1)	Fairbanks Response Base and Glennallen Response Base	Oil recovery	T + 3-7 hr
Aqua Guard skimmers (3)	Glennallen Response Base	Oil recovery	T + 6 hr
Desmi skimmers (4)	SERVS	Oil recovery	T + 3-7 hr
Decon unit	Fairbanks Response Base	Decontamination	T + 3 hr
Responders APSC and Ahtna (5) (TF-3)	Glennallen Response Base	Labor	T + 6 hr
Responders APSC and baseline contractor (2) (TF-3)	Fairbanks Response Base	Labor for containment and oil recovery	T + 3 hr
Helicopter (Air Log)	Fairbanks	Transport	T + 2 hr
5-person response crew for night shift (baseline contractor)	Fairbanks Response Base	Night shift	T + 12 hr
Storage Bladders	Yukon Response Base and Prudhoe Response Base	Recovery	T + 18 hr
Containment boom (1,000 feet)	Fairbanks Response Base	Containment	T + 3 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE MCSR.6 MINTON CREEK/SALCHA RIVER SCENARIO RESOURCE MOBILIZATION TABLE – CS8-7A

Containment and Recovery Operations			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
Boom pallets (2)	Yukon Response Base	Deploy boom	T + 8 hr
Fire boom (196 ft)	Fairbanks Response Base	Contingency	T + 8 hr
Aquaguard RBS-05 D2 skimmer	Yukon Response Base	Recover oil	T + 8 hr
Open top tanks 6,000 gallons	Yukon Response Base	Oil storage	T + 8 hr
Portable shelter	Yukon Response Base	Shelter	T + 8 hr
Decon unit	Yukon Response Base	Decontamination	T + 8 hr
Riverboat	Fairbanks Response Base	Transportation	T + 8 hr
Air boat	Fairbanks Response Base	Transportation	T + 8 hr
Responders and baseline contractor (4) (TF-4)	Yukon Response Base and Yukon Village	Labor	T + 8 hr
Responders APSC and baseline contractor (4) (TF-4)	Yukon Response Base and Fairbanks Response Base	Labor	T + 8 hr
3-person response crew for night shift (ACS)	North Slope - ACS	Night shift labor	T + 12 hr
Storage and Removal			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
50,000-gallon bladder (2)	Glennallen Response Base	Temporary storage	T + 12 hr
TDS 136 skimmer (1)	Prudhoe Bay (ACS)	Recovery	T + 24 hr
TDS 118 skimmer (2)	Prudhoe Bay (ACS)	Recovery	T + 24 hr
1,000-gallon tanks (2)	Prudhoe Bay (ACS)	Transport	T + 24 hr
Laborers (14; 7 per shift)	Fairbanks Response Base	Labor	T + 24 hr
Teamsters (2; 1 per shift)	Fairbanks Response Base	Labor	T + 24 hr
MI-30 skimmers (2)	Prudhoe Bay (ACS)	Recovery	T + 24 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE MCSR.7 MINTON CREEK/SALCHA RIVER SCENARIO RESOURCE MOBILIZATION TABLE – HAULING OF RECOVERED OIL

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Tank Truck - K&W (2) 10,000-12,000 gallon	Fairbanks Response Base	Trucks (2) and drivers (4) transporting oil	T + 12 hr
Vac trucks (2) 4,200 gallon	Yukon Response Base and Fairbanks Response Base	Transport recovered oil	T + 12 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE MCSR.8 MINTON CREEK/SALCHA RIVER SCENARIO SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

The oil spill site is subdivided into the following areas: a) release point, b) Minton Creek, c) McCoy Creek, and d) Salcha River. This table provides a recap of oil held on land, contained along Minton Creek and McCoy Creek, and stranded along these creek banks. Estimated oil recovery rates include anticipated emulsified oil volumes for each area.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Oil Recovered (Thousands of Barrels)							
			4 hr	12 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
Release point (on land)	14,574	0% 14,574	0	0.056	0.112	9	11	12	12[1]	2.6
Minton Creek, McCoy Creek – stream banks	3,000	10% 3,300	0	0	0	0	0	0	0[2]	3
Minton Creek, McCoy Creek – on water	34,025	28% avg 43,552	0	4.7	25.9	36.9	43.5	43.5	43.5	0

[1] Recovery operations pick up diminishing amounts of oil trapped on land until widely scattered pockets remain. Plans will be developed and implemented, as part of the long-term cleanup, to flood this area to float the oil for skimming.

[2] This oil is stranded along the stream banks and should be flushed and recovered as part of the long-term cleanup plan.

Scenario 2. Pump Station 1 Tank Spill

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from (b) (7)(F), (b) (3) that splits along a weld seam on the north side near the tank bottom and cannot be plugged.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures PS01.1 and PS01.2)
3. Timeline matrix (Table PS01.1)
4. On-site resource tally sheet (Table PS01.2)
5. Response organization charts (Figures PS01.3 through PS01.6)
6. Resource mobilization tables (Tables PS01.3 through PS01.6)
7. Summary of oil fate and estimated recovery table (Table PS01.7)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures PS01.1 and PS01.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table PS01.1). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table PS01.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures PS01.3 through PS01.6). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables PS01.3 through PS01.6). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table PS01.7).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system.

SCENARIO 2 – PUMP STATION 1 210,000-Barrel Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Oil Terminal Facilities (18 AAC 75.432)	(b) (7)(F), (b) (3) – crude oil

Source

Tank 110 side shell splits along a weld seam on the north side near the tank bottom and cannot be plugged.

Environmental Conditions

Time	1000	**Wind**	20 mph, from NE
Season	Summer – July 5	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	50ºF
Visibility	No precipitation	**Tide/Current**	Putuligayuk River 0.7 feet per second (fps)

Environmental Considerations – Tazlina River, Segment 1

The Putuligayuk (Put) River is classified as an anadromous fish stream at its lower end (2 miles downstream of Pump Station [PS] 1). Waterfowl may be present on any pond or lake and estuarine (marine areas). The spectacled eider is found in the marine and estuarine areas along the coast. Offshore, Beluga and Bowhead whale migration occurs westward in August, September, and October.

Assumptions

(b) (7)(F), (b) (3)

SCENARIO 2 – (b) (7)(F), (b) (3) [redacted]

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1.1	PS01 tank farm, general vicinity of the PS01 Tank Farm and the X-Pad Road containment will be by culvert blocking.	Volume 2, Table PS01.3
Volume 3, Section 4.1.1	Contain oil at containment sites CS1-1 and DS 15 by constructing Mega-Secur water dams and using collection and diversion boom.	Volume 2, Tables PS01.4 and PS01.5
Volume 3, Section 4.3	Recovery of oil from secondary containment will be by pumping spilled oil into Tank 111.	Volume 2, Table PS01.3
Volume 3, Section 4.1.1	Recovery of oil from containment sites CS1-3, CS1-1, DS 15, and CS1-0. Recovery of spilled oil will be by use of multiple pumps, skimmers, portable oil containers and vacuum trucks.	Volume 2, Tables PS01.4, PS01.5 and PS01.6, Section 4.3.3

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan."

Actions

1. Staff Member at PS01 notices spill and reports it to the PS01 Control Room.
2. Control Room notifies the Operations Control Center (OCC) and the PS01 Maintenance Supervisor (MS).
3. OCC notifies the Fairbanks Duty Officer who in turn notifies the Fairbanks Vice-President and the Pipeline Manager.
4. The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy.
5. The PS01 Control Room requests fire department support from the Greater Prudhoe Bay (GPB) via the Control Room "hot line" phone.
6. The PS01 Control Room contacts Alaska Clean Seas (ACS) and Mutual Aid support (BP and ConocoPhillips) to mobilize to PS01. Alyeska requests 20 initial ACS responders and 30 Mutual Aid responders.
7. The PS01 MS assumes the position of Initial Incident Commander and requests support from Galbraith Maintenance Base, Fairbanks Response Base, and Mutual Aid. The Prudhoe Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the MS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.

SCENARIO 2 – PUMP STATION 1
(b) (7)(F), (b) (3)

8. The Prudhoe Response Base P&CM assigns responders to the following task forces and locations:

   - 2 Prudhoe Response Base responders (TF-1) to close tank area storm drains, and another 4 Prudhoe Base Responders to begin berming and digging sumps outside of tank farm.
   - 4 Prudhoe Response Base responders (TF-1) to berm and dig sumps near containment.
   - 4 Response Base responders (TF-2) to block culvert and begin recovery of oil at the X-Pad Road (CS1-3).
   - 6 Galbraith Maintenance Base responders upon arrival are assigned to TF2.
   - 8 ACS responders and 2 Mutual Aid responders (TF-3) to ensure containment and begin recovery of oil at CS1-1. Note CS 1-1 is seasonally pre-boomed.
   - 10 ACS responders (TF-4) to boom and begin recovery of oil on the Put River at the DS 15 Road Crossing.
   - 5 Mutual Aid responders (TF-5) to place boom and begin recovery of oil at CS1-0.
   - 10 responders from the APSC Source Control Team in Fairbanks (TF-6) are requested to mobilize source control equipment and transfer pumps and are assigned to begin transferring contained product into Tank 111.

Oil Trajectory

Approximately 62 percent of the oil released remains in the secondary containment of the tank farm. Approximately 13 percent is trapped on land upgradient of CS1-3, contained on the north by the X-Pad Road and on the east by the Kuparuk Pipeline Road. Approximately 19 percent of the released oil flows into the Putuligayuk River, and flows downstream (northeast) as far as CS1-0 (approximately 4 miles) within 11 hours. Oil on the Putuligayuk River is contained at four locations. Tracking of the spilled oil is initially performed by vehicle and on foot to determine the perimeter of the spill. The helicopter (Air Log) stationed at Ga braith Maintenance Base is requested to proceed north to provide aerial surveillance. Alternatively, through the North Slope Mutual Aid Agreement, a helicopter or the ConocoPhillips Twin Otter is requested to provide aerial surveillance services.

Summary of Oil Fate and Estimated Recovery

The oil remaining in the secondary containment and tank yard (130,200 barrels) is recovered within 72 hours. 27,522 barrels is retained on land in the general vicinity of Tank 110. 6,600 barrels of oil, with 30 percent emulsification with water, are recovered at CS1-3 within 72 hours. 33,000 barrels of oil, with 30 percent emulsification with water, are recovered at CS1-1 within 72 hours. 10,500 barrels of oil, with 10 percent emulsification with water, are recovered at DS 15 within 72 hours. 2,148 barrels of oil, with 10 percent emulsification with water, are recovered at CS1-0 within 72 hours. See Table PS01.7. The spilled oil travels as far as CS1-0, which is approximately 4 miles downstream in the Putuligayuk River. The volumes of oil remaining on shoreline and land in the secondary containment are not subtracted from the volumes of oil assumed recovered at each location.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment,"* or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

[redacted]

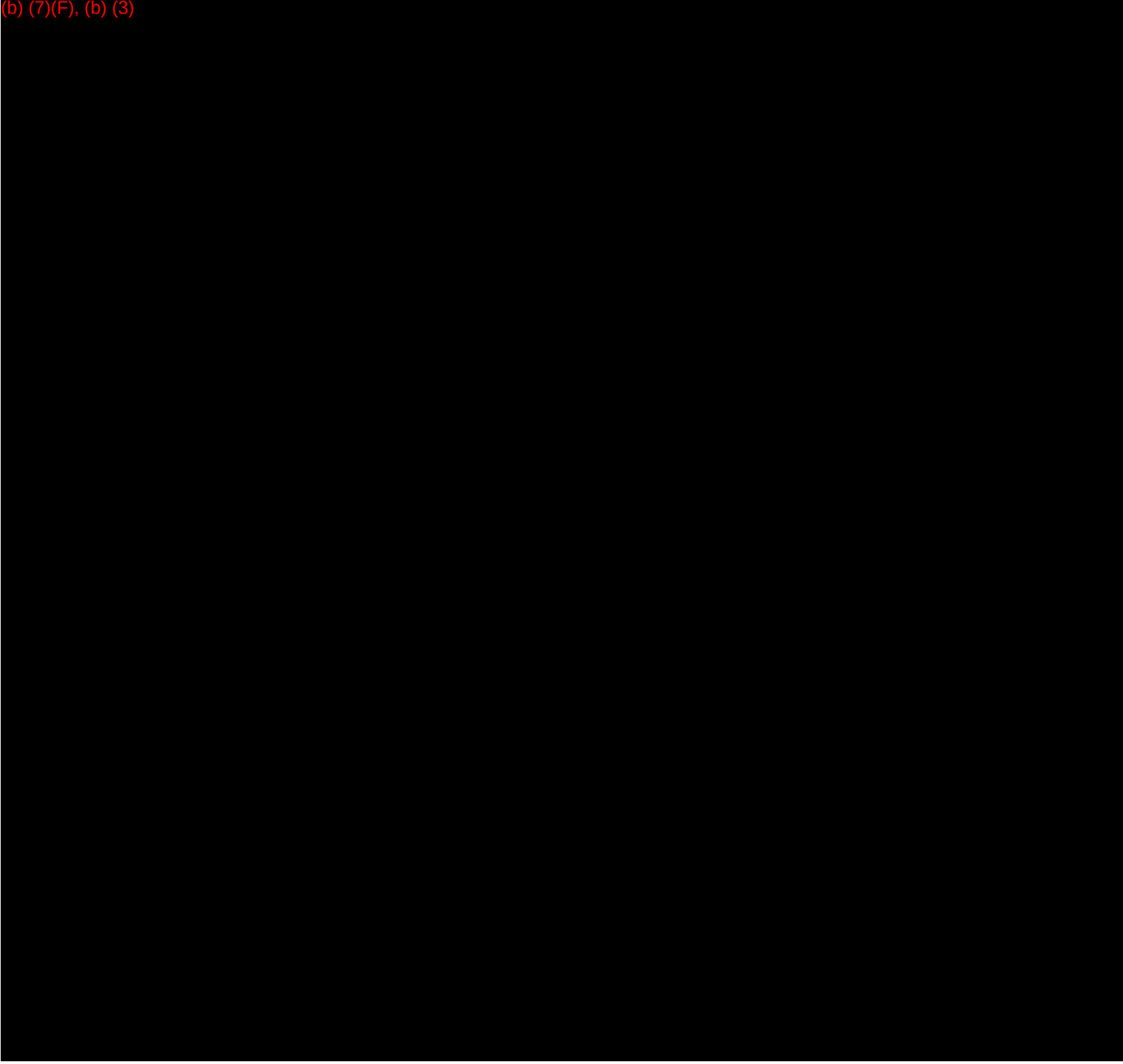


FIGURE PS01.1
PUMP STATION 1 SCENARIO MAP

(b) (7)(F), (b) (3)

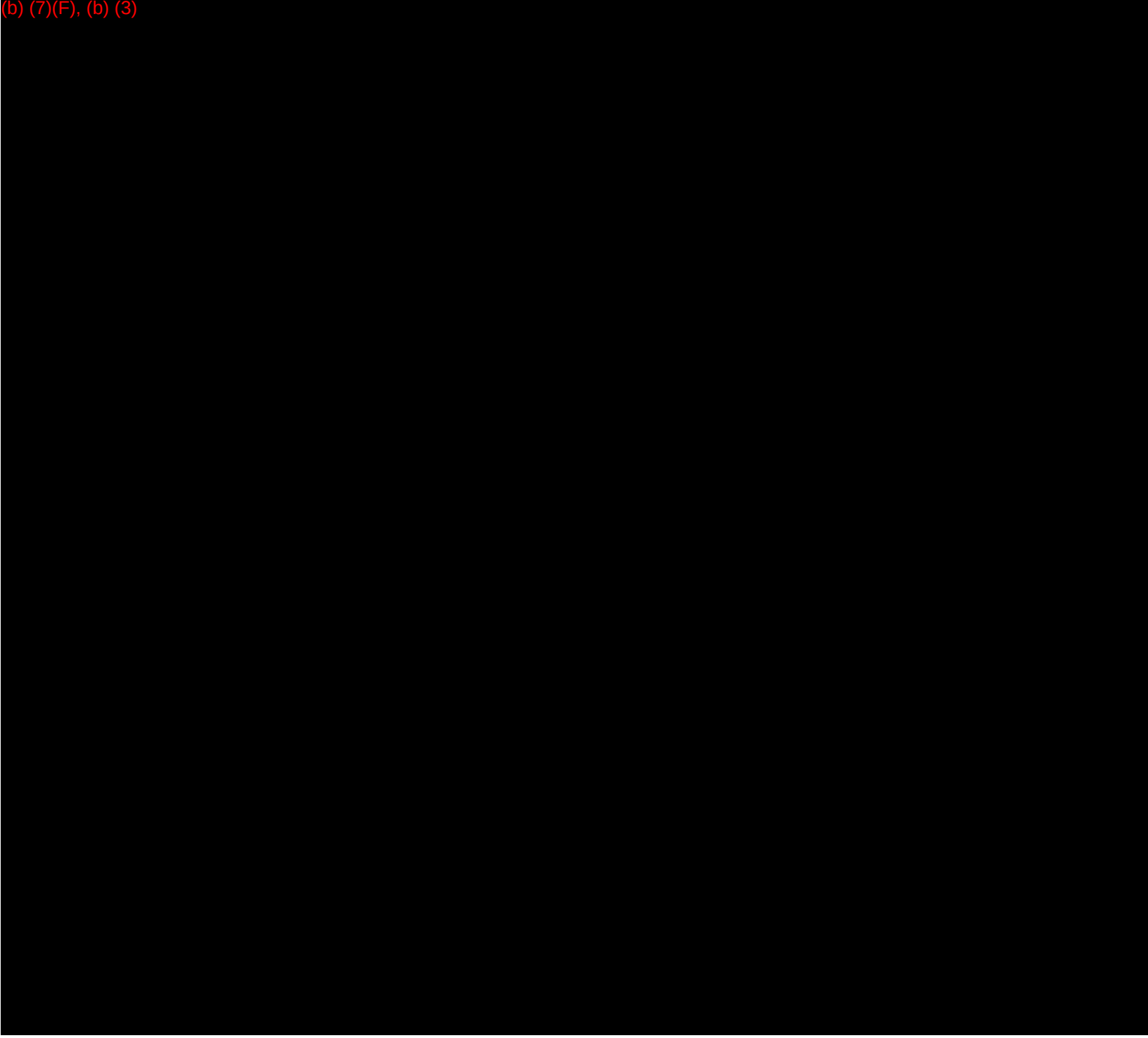


FIGURE PS01.2
PUMP STATION 1 SCENARIO DEPLOYMENT MAP

TABLE PS01.1 PUMP STATION 1 SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100), July 5	Hour 1-3 Day 1 (1100-1300), July 5	Hour 3-6 Day 1 (1300-1600), July 5	Hour 6-12 Day 1 (1600-2100), July 5	Night Shift (Hour 12-22) Day 1 (2100-2400); Day 2 (0000-0700), July 5 and 6
Situation/Status • **Weather** • **Environmental**	Season - Summer - July 5 Temperature - 50 ºF Winds – from NE at 20 mph.				
Objectives and Strategies1	**Objectives**	**Strategies**			
	Site security: safety, site control, surveillance.	Control site access. Perform and implement Site Safety and Control Analysis.			
	Contain spilled oil in the tank farm secondary containment system.	Dig sumps inside secondary containment for recovered oil. Pump oil in secondary containment into portable storage and vac trucks for re-injection into Tank 111, Flow Station 1, or GC3.			
	Restrict the spread of oil on land and water.	Engineering controls are constructed at appropriate locations (block culverts, bypass river through corrugated pipe and build gravel dam, place layers of boom on river).			
	Initiate recovery operations as soon as possible.	Deploy task forces and mobilize resources from Prudhoe Response Base, Alaska Clean Seas (ACS), and Alyeska Pipeline Service Company (APSC)			
	Protect sensitive areas and wildlife.	A wildlife response operation is immediately initiated (see TF-10).			
	Agency and stakeholder notification	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	Safety: Prudhoe Response Base Safety Officer arrives at the spill site with air monitoring equipment by T + 0.5 and conducts a site safety analysis using the "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. The information is radioed to the Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site.	Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If the LEL exceeds 20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck, wheeled 150- b extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires using high volume handlines. The primary mission of firefighters is personnel safety and protection. The following precautions are taken for fire protection: 1. A 150-pound wheeled extinguisher is positioned at CS1-3. 2. The fire department from the Greater Prudhoe Bay (GPB) Unit (BP) provides a fire truck and two operators for CS1-1, and a fire truck and two operators for DS 15. The request to the GPB fire department is made by the PS01 Control Room Operator (CRO) via the established "hot line" phone link to the fire departments. 3. A 150-pound wheeled extinguisher is positioned at CS1-0.			
Discharge Tracking	The tracking of the spilled oil in this scenario is initially by vehicle and on foot to determine the perimeter of the spill and extent of spread. The helicopter stationed at Ga braith Maintenance Base is requested to proceed north to provide aerial surveillance and arrives at T + 6 hours. Alternatively, through the North Slope Mutual Aid Agreement, a helicopter or Phillips Twin Otter can be requested to provide aerial surveillance services. Reporting of the oil perimeter and areas of contamination is almost continuous during the initial two hours of the response. Once the total area of oil coverage is determined, subsequent reports to the Incident Commander are hourly. Later reports during extended phase of cleanup will not be needed hourly.				
Protection of Environmentally Sensitive Areas (ESAs)	The On-Scene Incident Commander identifies protecting sensitive areas and wildlife as one of the incident objectives.				

TABLE PS01.1 (CONTINUED) PUMP STATION 1 SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100), July 5	Hour 1-3 Day 1 (1100-1300), July 5	Hour 3-6 Day 1 (1300-1600), July 5	Hour 6-12 Day 1 (1600-2100), July 5	Night Shift (Hour 12-22) Day 1 (2100-2400); Day 2 (0000-0700), July 5 and 6
Response Actions **Notification Process**	1. Staff member at PS01 notices spill and reports it to the PS01 Control Room. 2. Control Room notifies the Operations Control Center (OCC) and the PS01 MS. 3. OCC notifies the Fairbanks Duty Officer who in turn notifies the Fairbanks Vice President and the Pipeline Manager. 4. The following State and Federal agencies are notified by OCC: ADEC, NRC, BLM, and ADNR. This notification is followed up with a hard copy. 5. The PS01 Control Room requests fire protection support from the Greater Prudhoe Bay (GPB) Fire Department via the Control Room "hot line" phone. 6. The PS01 Control Room contacts ACS and Mutual Aid (BP and ConocoPhillips) to mobilize to PS01.				
Response Actions **Emergency Actions**	Based on the above notifications, a number of simultaneous response actions begin: 1. All crude oil inputs into Tank 110 are secured. This is accomplished by an ISOLATE STATION command. 2. The PS01 MS assumes the position of Initial Incident Commander and the Prudhoe Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the MS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. 3. If it is safe to do so, 2OT1 and 2OT2 are reopened and Tank 110 is deinventoried through the use of the mainline and booster pumps. 4. The flare is shut down to minimize the explosion/fire hazard. 5. A site safety assessment is conducted to ascertain the immediate threat to the personnel at PS01. The Incident Commander places the pump station on notice that an evacuation may be required.				
Response Actions **Task Force 1** **Pump Station 1 Tank Farm and X-Pad Road Containment and Recovery (CS1-3)**	Two on-site pump station responders are dispatched with appropriate PPE to ensure that the tank d ke area storm water drains are closed. 130,200 barrels of oil are contained by secondary containment in the tank dike area. This equipment is shown in Table PS01.3 An additional 27,552 barrels retained on land in the general vicinity of Tank 110.	Four on-site responders are dispatched to contain product outside of secondary containment utilizing a front end loader to berm and dig collection sumps. Six responders are requested to mobilize from the Prospect Response Base to join TF-1.	Recovery of oil inside Tank Farm secondary containment is completed by TF-6.	Six responders from the Prospect Response Base arrive and join TF-1 in recovery operations in the general vicinity of Tank 110.	A six-person night shift arrives at T + 12 to continue recovery operations. This crew is also assigned to dig sumps to use as collection points for the recovery of oil within the Tank Farm secondary containment.
Response Actions **Task Force 2** **Contain and Recover Oil at X-Pad Road Containment (CS1-3)**		Four on-site responders are dispatched to stop the flow of oil into the Put River by blocking the culvert on the X-Pad Road utilizing culvert plugs. This is designated as CS1-3. The work is completed by T + 2 hours. Approximately 6,600 barrels are contained at the X-Pad Road containment (CS1-3). Six responders mobilize by aircraft from Galbraith Maintenance Base.	TF-2 starts oil recovery operations at CS1-3. Six responders arrive from Galbraith Response Base at T + 6 hours and are deployed to CS1-3 with equipment in Table PS01.3 for recovery operations	6,600 barrels of oil are contained at this location. TF-2 uses (2) Elastec Groove Skimmers (TDS118G), (2) Vac Trucks and storage tanks to recover oil. Based on a 24 hour/day operation and recovery rate of 97 bph, the gross oil is removed from this location in approximately 68 hours.	A six-person night shift arrives at T + 12 to continue recovery operations

TABLE PS01.1 (CONTINUED) PUMP STATION 1 SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100) July 5	Hour 1-3 Day 1 (1100-1300) July 5	Hour 3-6 Day 1 (1300-1600) July 5	Hour 6-12 Day 1 (1600-2100) July 5	Night Shift (Hour 12-22) Day 1 (2100-2400); Day 2 (0000-0700) July 5 and 6
Response Actions **Task Force 3** **Contain Oil at CS1-1**	Four ACS Responders mobilize to CS1-1 with equipment shown in Table PS01.4.	Responders from Alaska Clean Seas arrive at T + 1 hour to boom the Put River at CS1-1 (with equipment shown in Table PS01.4). CS 1-1 is seasonally boomed. Responders adjust boom to ensure maximum containment	The work is completed by T + 5 hours. Approximately 33,000 barrels of oil are contained at this site.	A crew of six additional ACS responders arrives at T + 6 hours with equipment listed in Table PS01.4 and are deployed to CS1-1. TF-3 recovers oil into portable tankage utilizing (3) Lamor MiniMax skimmers, (2) Desmi 250 skimmers and vac trucks. Based on a 24 hour/day operation and recovery rate of 836 bph, the gross oil is removed from this location in approximately 40 hours.	A six-person night shift arrives at T + 12 to continue recovery operations.
Response Actions **Task Force 4** **Contain Oil at DS 15 Road Crossing**	Four ACS responders mobilize with equipment shown in Table PS01.5 to an area of opportunity at the DS15 road crossing.	ACS arrives on-site at T + 2 hours to block the Put River at the DS15 road crossing utilizing Mega-Secur water dams and containment and diversionary boom.	The oil is moving down the Put River at 0.5 mph. The leading edge of the oil reaches this location at T + 6 hours. ACS responders arrive at T + 2 hours and complete the blocking operation shortly after the leading edge of the oil has passed this point. 10,500 barrels of oil are contained at this site.	A crew of four ACS and 2 Mutual Aid responders arrive at T + 8 hours with equipment shown in Table PS01.5 and deploy to this location.	A six-person night shift arrives at T + 12 to continue recovery operations. Based on a 24 hour per day operation and recovery rate of 160 bph, the gross oil is removed from this location in approximately 66 hours.
Response Actions **Task Force 5** **Contain and Recover Oil at CS1-0**	Five Mutual Aid responders mobilize to CS1-0. ACS mobilizes equipment in Table PS01.6 to CS1-0.	The Mutual Aid response crew (5 responders), through ACS equipment arrive at T + 2 hours to CS1-0. Four successive layers of boom are laid across the river upstream of the West Dock Road Bridge. Once this has been completed, skimming systems and temporary storage is set up to begin recovering oil.	Boom placement is complete by T + 4 hours.	The first oil begins to arrive at this location at T + 11 hours. Approximately 2,148 barrels of oil are contained at this site.	A five-person night shift arrives at T + 12 to continue recovery operations. Based on a 24 hour per day operation and a combined recovery rate of 61 bph, the gross oil is removed from this location in approximately 35 hours.
Response Actions **Recovery Operation** **Task Force 6** **Recovery of Oil from Secondary Containment**		10 responders from the APSC Source Control Team in Fairbanks are requested to mobilize source control equipment and transfer pumps. The source control team and equipment estimated time of arrival (ETA) is T + 18 hours.			130,200 barrels of oil are contained in secondary containment, with an additional 27,552 barrels retained on land in the general vicinity of Tank 110. Using the tank farm work pad and the south wall of the tank farm dike, six sumps are dug using an excavator. These sumps are used as collection points for crude oil. 4" Source Control Transfer pumps brought in from Fairbanks are used to recover oil which is injected through the valves directly into Tank 111. At a capacity of 2,142 barrels per hour (bph), it takes approximately 61 hrs to recover the gross oil from the containment area once the pumps are in place.
Wildlife Protection/ Rehabilitation **Task Force 7** **Wildlife Response**	A wildlife response operation is immediately initiated as outlined in Section 1.7.10. "Wildlife Protection", of the Plan. The Field Environmental Generalist (FEG) takes the following steps: 1. ACS and Mutual Aid are requested to provide ten wildlife hazers to work under the supervision of the EC hazing team leaders. The hazers arrive on site at T + 5 hours. 2. ACS is contacted to mobilize the wildlife treatment center stationed in the eastern operating area. 3. The International Bird Rescue Research Center (IBRRC) out of Berkeley, California, is notified and requested to mobilize a full scale hazing operation as well as capture and stabilization operation. This includes making the Anchorage wildlife facility operational. The IBRRC is on location within 24 hours and takes over coordination of the overall wildlife response operation.				

TABLE PS01.1 (CONTINUED) PUMP STATION 1 SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100) July 5	Hour 1-3 Day 1 (1100-1300) July 5	Hour 3-6 Day 1 (1300-1600) July 5	Hour 6-12 Day 1 (1600-2100) July 5	Night Shift (Hour 12-22) Day 1 (2100-2400); Day 2 (0000-0700) July 5 and 6
General Information	The primary use of vac trucks listed in this scenario is to pump recovered oil from containment site recovered oil temporary storage tanks and transport the oil back to PS01 for injection in to Tank 111 of the station crude oil sump, or if necessary, at Flow Station 1 or GC3. Given the unhindered access to containment and recovery sites, and the number of trucks used, the load, transport, deliver, and return cycle of an average 1.5 hour round trip does not have an impact on oil recovery operations. Temporary recovered oil storage tanks described in this scenario are open top storage tanks and Frac tanks. Open top storage tanks are the generic term for frame-supported impermeable fabric tanks such as Fastank or Fold-A-Tank. Frac tank is the generic term for portable steel skid tanks used in oil well drilling operations to contain formation fracturing compounds. Decanting of water recovered with the oil is necessary to maximize the capacities of temporary oil storage containers. Decanting is accomplished by gravity draining water from a tank or bladder bottom drain via hose. The drained water is discharged back to the river or stream at a location ahead of the containment and recovery device. Decanting is controlled to a visual standard of clear water. Decanting is shut off when oil begins to appear in the discharge flow stream. Oil and emulsified oil is retained in the storage container.				
Communications	Because of the flat terrain and close proximity of the containment and recovery sites, radio communications can be accommodated without portable radio repeaters. An Incident Communications Plan will be developed and implemented as part of the first and subsequent Incident Action Plan(s).				
Transportation	Transportation of personnel and equipment referenced in this scenario as originating on the North Slope is via heavy trucks, medium-sized flat beds, and light duty vehicles driving along the network of roads in the Prudhoe Bay area. Personnel and equipment listed as originating from Valdez would arrive in the shortest time possible by using a chartered aircraft that arrives from Anchorage, loads out in Valdez, and flies directly to Deadhorse airport. Transportation from the work site to housing locations at GPB and contractor camps for berthing will be by surface transportation.				
Reevaluation of Objectives	The Incident Management Team Incident Commander, the Federal On-Scene Coordinator, and the State On-Scene Coordinator will continuously monitor the response organization's performance in achieving the incident objectives. Adjustments to the objectives and supporting tactics will be made as needed throughout the course of the response. As the spread of oil is secured, cleanup of oiled land and shoreline will become an added focus of the incident action plan.				

TABLE PS01.1 (CONTINUED) PUMP STATION 1 SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Hour 22 + Day 2 (0700) + July 5 +
Shoreline Cleanup	During the days that follow, cleanup activities focus on the oil remaining along the shorelines of the Put River and other affected drainages. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimum disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel mixed with peat, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge and recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are utilized to recover deeper pools of oil when possible. Oiled peat slurries may be removed by small loaders and transported to stable areas for cleaning. Peat outcrops will be raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about two weeks, the shoreline cleanup crews recover about one-half of the oil volume estimated to remain on shore following completion of initial recovery efforts. The initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.
Waste Management	Oil recovered from containment sites CS1-0, CS1-1, CS1-3, and DS 15 is taken to either Flow Station 1 or GC3 in the GPB for reinjection into crude oil stream for shipping through TAPS. Oiled gravel on the work pad is stored in a temporary lined area for later cleaning or incineration and reuse. Solid waste is segregated and placed in clear bags: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved, lined secondary containment area. This soil will be thermally remediated on site. Plans are developed to remediate the 27,552 bbl of oil trapped on land between the Tank Farm and CS1-3. Alyeska works with the agencies to evaluate alternatives and develop the long-term cleanup plan.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE PS01.2 PUMP STATION 1 SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1000-1100								Hour 1-3 1100-1300							Hour 3-6 1300-1600						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--	--	--	--	--	--	--	--	1 helicopter (1)[4]	--	--	--	--	--	--	1 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	2 ea. 150 lb extinguishers	--	--	--	--	--	2 fire trucks (4)	2 ea. 150 b extinguishers	--	--	--	--	--	2 fire trucks (4)	2 ea. 150 lb extinguishers	--	--	--	--
Safety	Site Safety and Control[6]	--	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Response Actions	Pump Station 1 Recover Oil at Tank Farm and X-Pad Road	TF-1	2	2	--	--	--	--	--	--	10	Excavator/Backhoe Loader (1)[7]		--	--	--	--	10	Excavator (1) [Loader (1)[7]	--	--	--	--	--
	Contain and Recover Oil at CS1-3	TF-2	--	--	--	--	--	--	--	--	4	Loader (1)	Culvert Plugs 26 ft Summer Response Trailer	--	--	--	--	10	Loader (1)	Culvert Plugs 26 ft Summer Response Trailer	--	--	--	--
	Contain and Recover Oil at CS1-1	TF-3	--	--	--	--	--	--	--	--	4	Loader (1)	3,000 ft boom Mega-Secur Water Dams (2) Decon trailer	--	--	--	--	10	Loader (1)	3,000 ft boom Mega-Secur Water Dams (2) Decon trailer	--	--	--	--
	Contain and Recover Oil at DS 15 Road Crossing	TF-4	--	--	--	--	--	--	--	--	4	Loader (10)	2,000 ft boom Mega-Secur Water Dams (2)	--	--	--	--	4	Loader (1)[8]	2,000 ft boom Mega-Secur Water Dams (2)	--	--	--	--
	Contain and Recover Oil at CS1-0	TF-5	--	--	--	--	--	--	--	--	5	2 work boats (2)[7]	5,000 ft boom Decon trailer Elastec TDS 118 Drum Skimmer (2) Aqua Guard RBS - 5 Brush Skimmer (2)	3	[redacted]	9	[redacted] total	5	2 work boats (2)[7]	5,000 ft boom Decon trailer Elastec TDS 118 Drum Skimmer (2) Aqua Guard RBS - 5 Brush Skimmer (2)	3	[redacted]	9	536
	Recovery of Oil from Secondary Containment	TF-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Recovery of Oil from CS1-0	TF-6	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Wildlife	Wildlife Hazing	TF-7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE PS01.2 (CONTINUED) PUMP STATION 1 SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1000-1100								Hour 1-3 1100-1300							Hour 3-6 1300-1600						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Personnel Total			Note[8]		--						23	10	1					23	10	1				
Mechanical Equipment Total					--	2						8	6						8	6				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] On-land containment and recovery task force personnel conduct ground tracking; therefore, totals are not tallied here.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On land containment and recovery task force personnel conduct ground tracking; therefore totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

[8] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

TABLE PS01.2 (CONTINUED) PUMP STATION 1 SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 6-12 1600-2100							Hour 12-22 2100- 0700							Hour 22 + 0700 +						
			People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
						No.	Cap (bbl/hr)	No.	bbl				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	1	--	--	--	--	--	--	1	--	--	--	(b) (7)(F), (b) (3)	--	(b) (7)(F), (b) (3)	1	--	--	--	(b) (7)(F), (b) (3)	--	(b) (7)(F), (b) (3)
Discharge Tracking	Aerial Tracking[4]	DT	--	--	1 helicopter (1)[4]	--	--	--	--	--	--	1 helicopter (1)	--		--		--	--	1 helicopter (1)[4]	--		--	
	Ground Tracking[5]	DT	--	--	--	--	--	--	--	--	--	--	--		--		--	--	--	--		--	
Fire Protection	Fire Protection	FP	--	2 fire trucks (4)	2 ea. 150 lb. extinguishers	--	--	--	--	--	--	2-150 lb extinguishers	--		--		--	2 fire trucks (4)	2 ea.150 lb. extinguishers	--		--	
Safety	Site Safety and Control[6]	--	1	--	--	--	--	--	--	1	--	--	--		--		1	--	--	--		--	
Response Actions	Recover Oil at Pump Station 1 Tank Farm	TF-1	16	Excavator (1) Loader (1)[7] Vac Truck (2)		3[8]	85.5[9]	--	--	16	Excavator (1) Loader (1)[7] Vac Truck (2)	(2) 4 ft Gorman Rupp Transfer Pumps	3[8]		--		16	Excavator (1) Loader (1)[7] Vac Truck (2)	(2) 4 ft Gorman Rupp Transfer Pumps	3[8]			
	Contain and Recover Oil at CS1-3	TF-2	10	Loader (1)[7] 2 Vac Truck (2)[9]	Culvert Plugs (2) Elastec Groove Skimmers TDS 118G	4[8]	97[9]	4	288	10	Loader (1)[7] Vac Trucks (2)[9]	Culvert Plugs (2) Elastec Groove Skimmers TDS 118G	4[8]		4		12	Loader (1) 2 Vac Truck (2)[9]	Culvert Plugs (2) Elastec Groove Skimmers TDS 118G	4[8]		4	
	Contain and Recover Oil at CS1-1	TF-3	10	Vac Truck (4)[9] Loader (1)[7]	3,000 ft boom Mega-Secur Water Dams (2) Desmi 250 skimmer (2) Lamor MiniMax 30 (1) Lamor MiniMax 20 (2) Decon Trailer	12[8]	836[9]	6	3,000	10	Vac Truck (4)[9] Loader (1)[7]	3,000 ft boom Mega-Secur Water Dams (2) Desmi 250 skimmer (2) Lamor MiniMax 30 (1) Lamor MiniMax 20 (2) Decon trailer	12[8]		6		10	Vac Truck (4)[9] Loader (1)[7]	3,000 ft boom Mega-Secur Water Dams (2) Desmi 250 skimmer (2) Lamor MiniMax 30 (1) Lamor MiniMax 20 (2) Decon trailer	12[8]		6	
	Contain and Recover Oil at DS 15 Road Crossing	TF-4	10	Vac Truck (3) Loader (1)	2,000 ft boom Mega-Secur Water Dams (2) Aqua Guard RBS - 5 Brush Skimmer (2) Komara Skimmer	5[8]	160[9]	6	357	10	Vac Truck (3) Loader (1)	2,000 ft boom Mega-Secur Water Dams (2) Aqua Guard RBS - 5 Brush Skimmer (2) Komara Skimmer	5[8]		6		10	Vac Truck (3) Loader (1)	2,000 ft boom Mega-Secur Water Dams (2) Aqua Guard RBS - 5 Brush Skimmer (2) Komara Skimmer	5[8]		6	
	Contain and Recover Oil at CS1-0	TF-5	10	Vac Truck (1) 2 work boats (2)[7]	5,000 ft boom Decon trailer Elastec TDS 118 Drum Skimmer (2) Aqua Guard RBS- 5 Brush Skimmer (2)	3	61	9	535 total	10	Vac Truck (1) 2 work boats (2)[7]	5,000 ft boom Decon trailer Elastec TDS 118 Drum Skimmer (2) Aqua Guard RBS- 5 Brush Skimmer (2)	3		9		10	Vac Truck (1) 2 workboats (2)[7]	5,000 ft boom Decon trailer Elastec TDS 118 Drum Skimmer (2) Aqua Guard RBS- 5 Brush Skimmer (2)	3		9	
	Recovery of Oil From Secondary Containment	TF-6	--	--	--	--	--	--	--	--	Excavator (1)	(2) Godwin 4"x4" CD100 High Volume Pumps (2) Lamor GT A 30 pump 5,000 ft hose	--		--		10	Excavator (1)	(2) Godwin 4"x4" CD100 High Volume Pumps (2) Lamor GT A 30 pump 5,000 ft hose	--		--	

TABLE PS01.2 (CONTINUED) PUMP STATION 1 SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 6-12 1600-2100							Hour 12-22 2100- 0700							Hour 22 + 0700 +						
			People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
						No.	Cap (bbl/hr)	No.	bbl				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Wildlife	Wildlife Hazing	TF-7	10	--	--	--	--		--	10	--	--	--	--	--	--	IBRRC (10)	--	--	--	--	--	--
On-Scene Comms.	Communications Support	Comms.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			68	21	1					68	18	1					80	21	1	--	--	--	--
Mechanical Equipment Total				20	15						19	24					--	20	20	--	--	--	--

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On land containment and recovery task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] This equipment operator is also a responder and is included in the number shown in the “People for Ops” column.

[8] Skimmer count includes Vac Trucks.

[9] Vac trucks utilized for recovery are derated to 28.5 bbls/hr.

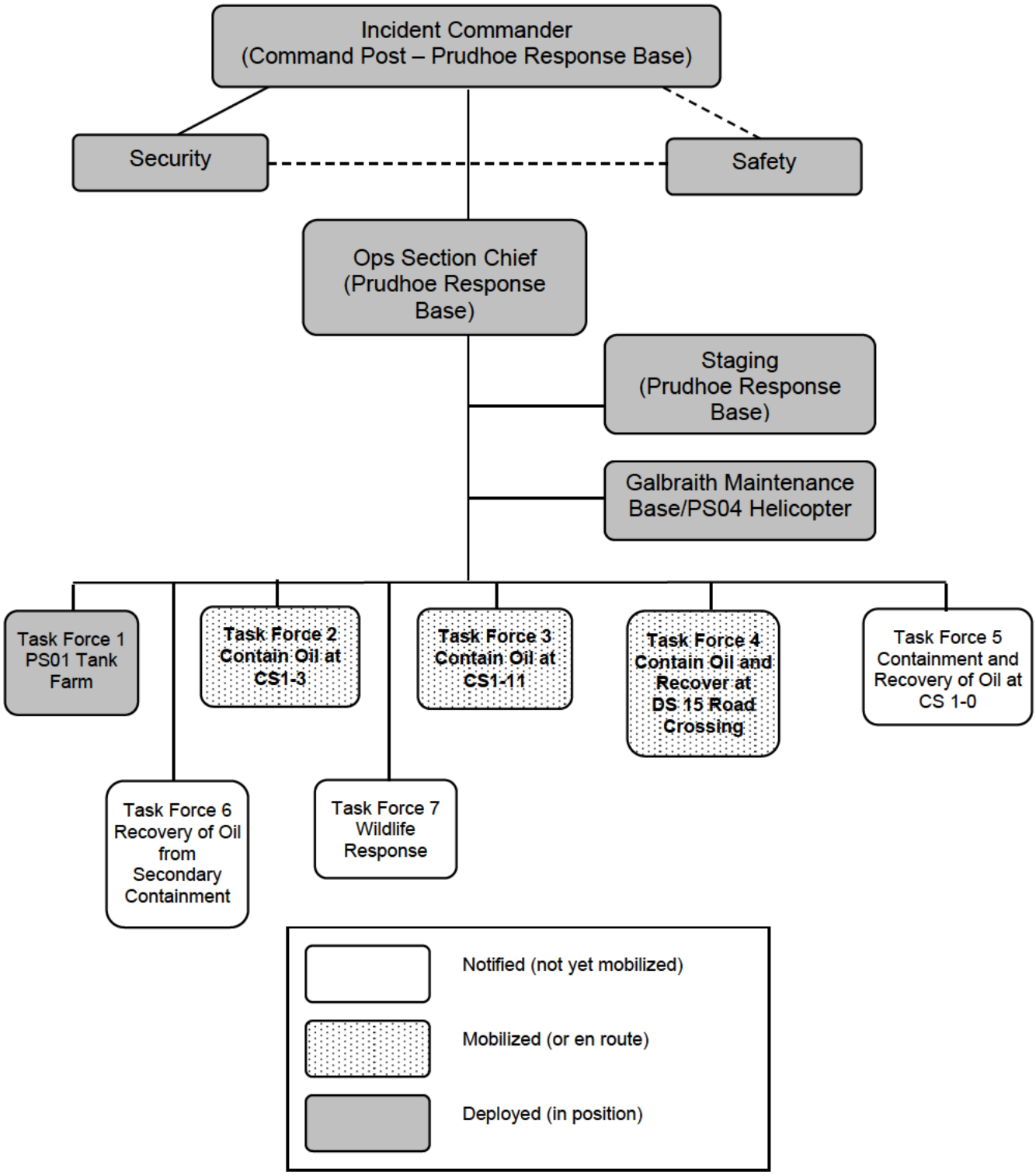


FIGURE PS01.3
PUMP STATION 1 SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

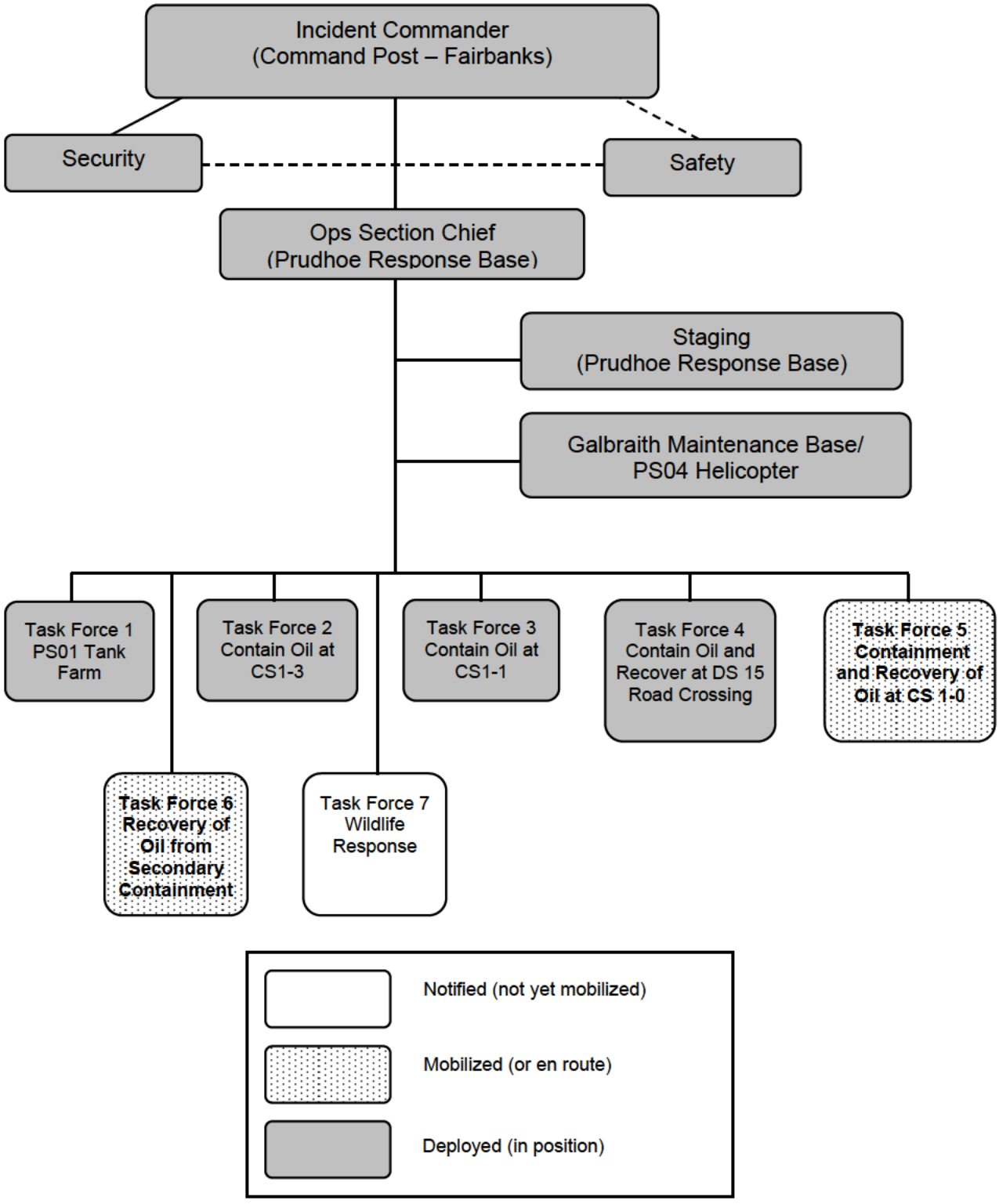


FIGURE PS01.4
PUMP STATION 1 SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

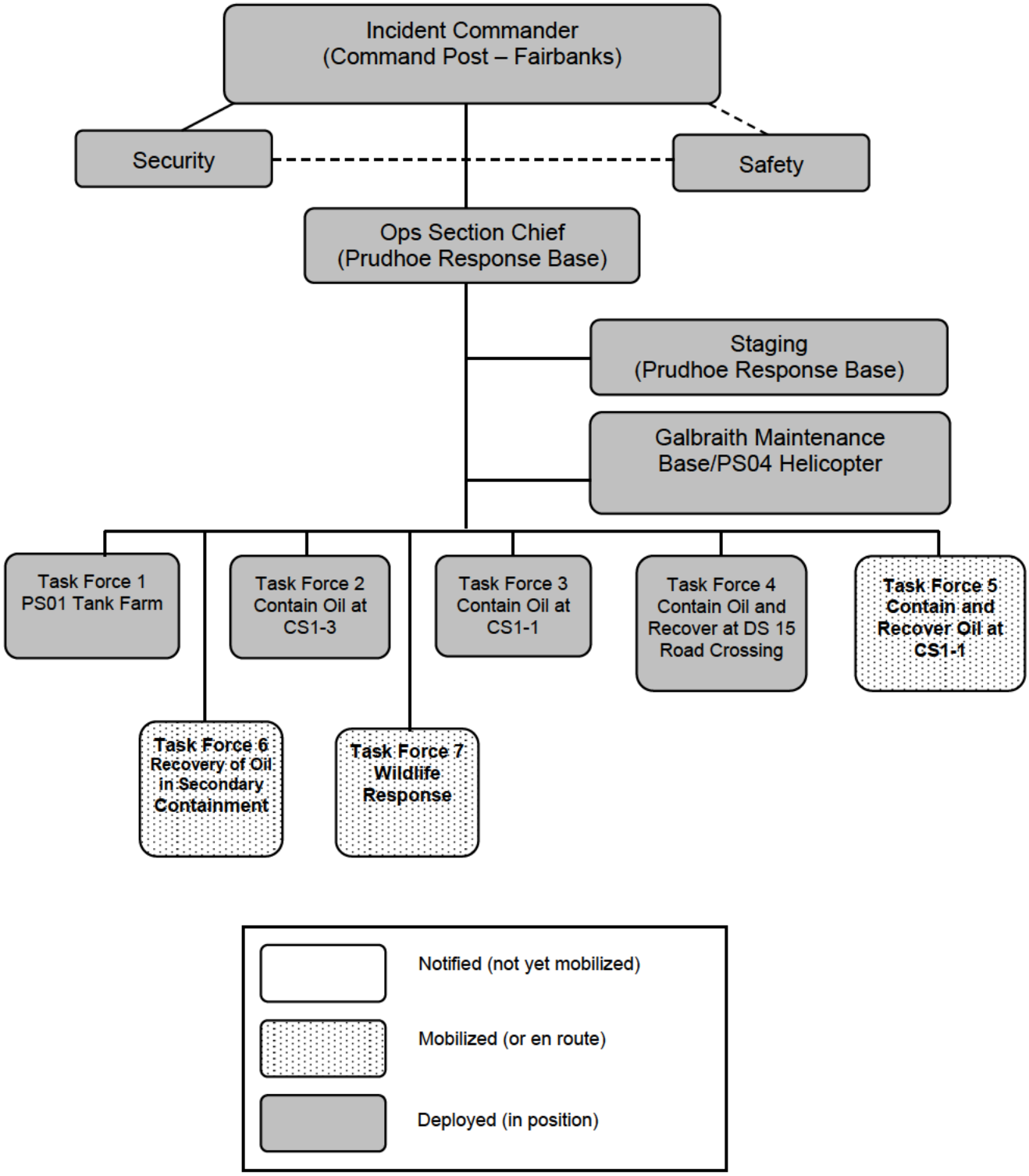


FIGURE PS01.5
PUMP STATION 1 SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-6

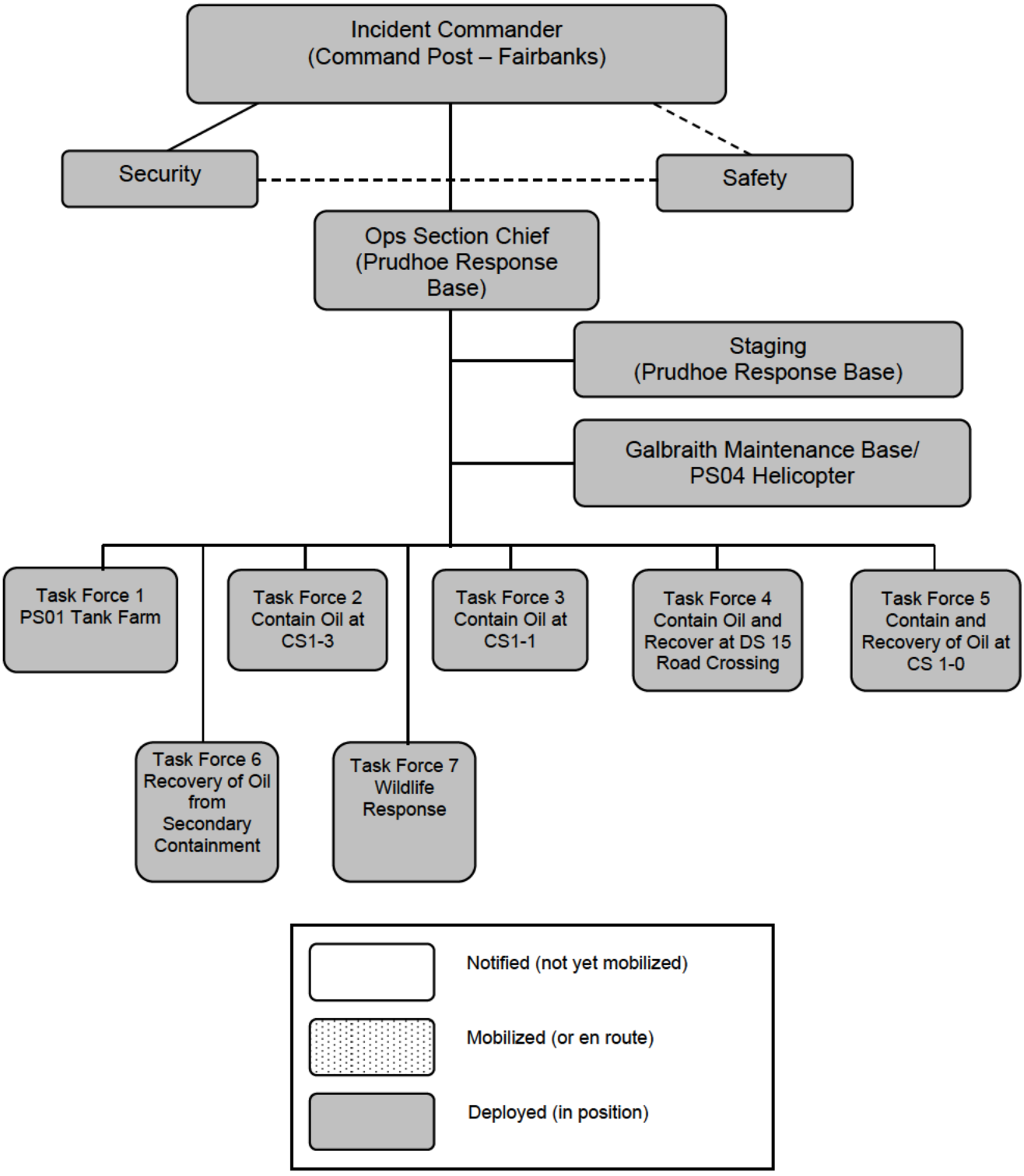


FIGURE PS01.6
PUMP STATION 1 SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 6+

TABLE PS01.3 PUMP STATION 1 SCENARIO RESOURCE MOBILIZATION – TANK FARM SECONDARY CONTAINMENT AND X-PAD ROAD (CS1-3)

CONTAIN OIL AT TANK FARM AND X-PAD ROAD			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
150-lb Extinguisher (1)	Prudhoe Response Base	Contingency	T + 0.5 hr
Responders - TF-1 (2) with appropriate PPE	Prudhoe Response Base	Ensure tank area storm water drains are closed	T + 0.5 hr
Loader	Prudhoe Response Base	Berm and Dig Sumps outside of secondary containment	T + 1 hr
Responders – TF-1 (4)	Prudhoe Response Base	Berming and digging sumps outside of containment	T + 1 hr
Culvert Plugs	Prudhoe Response Base	Block culvert at X-Pad Road (CS1-3)	T + 1 hr
Responders - TF-2 (4) with appropriate PPE	Prudhoe Response Base	X-Pad Road culvert blocking	T + 1 hr
RECOVERY EQUIPMENT REQUIREMENTS AT TANK FARM AND X-PAD ROAD (CS1-3)			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Responders – TF-2 (6)	Ga braith Maintenance Base	TF–1 Recover oil outside of secondary containment.	T + 6 hr
Elastec Groove Skimmer TDS 118G (2)	Prudhoe Response Base	Skimmer for CS1-3	T + 6 hr
Storage tanks (4)	Prudhoe Response Base	Recovered oil storage, 2,400 gallons at CS1-3	T + 6 hr
Vac trucks, 200 bbl (4)	APSC/Mutual Aid	Recovered oil transport from CS1-3	T + 6 hr
Responders – TF-1 (6)	Prospect Response Base	Assist in recovery	T + 8 hr
Responders (6) TF-1 Responders (6) TF-2	Mutual Aid	Night Shift	T + 12 hr
Excavator	Mutual Aid	Dig sumps in Tank Farm	T + 12 hr
Responders - TF-6 (10)	Fairbanks Response Base	Recover oil in Tank Farm	T + 18 hr
4 Godwin 4”x4” high volume transfer pumps	Fairbanks Response Base	Pump oil from secondary containment into Tank 111	T + 18 hr
(2) Lamor GT A 30 pump	Fairbanks Response Base	Pump oil from secondary containment into Tank 111	T + 18 hr

TABLE PS01.3 (CONTINUED) PUMP STATION 1 SCENARIO RESOURCE MOBILIZATION – TANK FARM SECONDARY CONTAINMENT AND X-PAD ROAD (CS1-3)

CONTAIN OIL AT TANK FARM AND X-PAD ROAD			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Hose (5,000 ft)	Fairbanks Response Base	Pump oil from secondary containment into Tank 111	T + 18 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE PS01.4 PUMP STATION 1 SCENARIO RESOURCE MOBILIZATION – CS1-1

CONTAIN OIL AT CS1-1			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Responders - TF-3 (4)	ACS	Boom and recover oil	T + 1 hr
Loader (operator included in crew of 4 – TF-3)	Mutual Aid	Material handling	T + 1 hr
Mega-Secur water dams (2)	Prudhoe Response Base	Boom and recover oil	T + 1 hr
Decon Trailer	Mutual Aid	Personnel decon	T + 2 hr
Fire Truck with 2 firefighters	Mutual Aid	Contingency	T + 1 hr
RECOVERY EQUIPMENT REQUIREMENTS AT CS1-1			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Responders - TF-3 (6)	ACS	Recover oil	T + 6 hr
Desmi 250 skimmer (2)	ACS	Recover oil	T + 6 hr
Lamor MiniMax 30 skimmer	ACS	Recover oil	T + 6 hr
Lamor MiniMax 20 skimmer (2)	ACS	Recover oil	T + 6 hr
Open top tanks (6)	ACS	Oil storage, 2,500 gallons, each	T + 6 hr
Vac trucks (4) with operators	Prudhoe Bay (ACS)	Oil transport, 200 barrels	T + 6 hr
Responders (6) TF-3	Mutual Aid	Night Shift	T + 12 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE PS01.5 PUMP STATION 1 SCENARIO RESOURCE MOBILIZATION – DS 15 ROAD CROSSING

CONTAIN OIL AT DS 15 ROAD CROSSING			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Mega-Secur water dams (2)	ACS	Containment	T + 2 hr
2,000 ft containment boom	ACS	Containment	T + 2 hr
Responders (4) TF-4	ACS	Boom and recover oil	T + 2 hr
Loader (operator included in crew of 4, TF-4)	ACS	Material handling	T + 2 hr
Fire Truck with 2 firefighters	Mutual Aid	Contingency	T + 1 hr
RECOVERY EQUIPMENT REQUIREMENTS AT DS 15 ROAD CROSSING			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Responders - TF-4 (4)	ACS	Skimmer operators	T + 8 hr
Responders - (2) TF-4	Mutual Aid	Skimmer operators	T + 8 hr
Aqua Guard RBS 5 Brush skimmer (2)	ACS	Recover oil	T + 8 hr
Komara Disc	PS01	Recover oil	T + 8 hr
Frac tanks (6)	Mutual Aid	Oil storage, 500 barrels, each	T + 8 hr
Vac trucks (3) with operators	Mutual Aid	Oil transport, 200 barrels	T + 8 hr
Responders (6) TF-4	Mutual Aid	Night Shift	T + 12 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE PS01.6 PUMP STATION 1 SCENARIO
RESOURCE MOBILIZATION – CS1-0

CONTAIN OIL AT CS1-0			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Responders - TF-5 (5)	Mutual Aid	Contain and recover oil	T + 2 hr
150-lb Extinguisher (1)	Prudhoe Response Base	Contingency	T + 0.5 hr
Boom (5,000 feet)	ACS	Contain and recover oil	T + 2 hr
Work boats (2)	ACS	Contain and recover oil	T + 2 hr
9 – Open top tanks (9)	ACS	2,500 gallons each	T + 2 hr
Decon trailer	ACS	Personnel decon	T + 2 hr
RECOVERY EQUIPMENT REQUIREMENTS AT CS1-0			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA On Site**
Responders - TF-5 (5)	Mutual Aid	Skimmer operators and night shift	T + 8 hr
Elastec Drum Skimmer TDS 118 skimmer (2)	ACS	Skimmers	T + 8 hr
Aqua Guard RBS 5 Brush skimmer (1)	ACS	Skimmer	T + 8 hr
Open top tanks (9)	ACS	Oil storage, 2,500 gallons, each	T + 8 hr
Vac truck (1) with operator	Mutual Aid	Oil transport, 200 barrels	T + 8 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE PS01.7 PUMP STATION 1 SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Oil Recovered (thousands of barrels)								
			6hr	12hr	24hr	36hr	48hr	60hr	72hr	Total	Remaining
Secondary containment	(b) (7)(F), (b) (3)										
On land											
CS1-3											
CS1-1											
DS 15 Road Crossing											
CS1-0											

Scenario 3. Sag River

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from a longitudinal stress crack in an belowground pipeline segment.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures SAGR.1 and SAGR.2)
3. Timeline matrix (Table SAGR.1)
4. On-site resource tally sheet (Table SAGR.2)
5. Response organization charts (Figures SAGR.3 through SAGR.7)
6. Resource mobilization tables (Tables SAGR.3 through SAGR.7)
7. Summary of oil fate and estimated recovery table (Table SAGR.8)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures SAGR.1 and SAGR.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table SAGR.1). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table SAGR.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures SAGR.3 through SAGR.7). The sixth component consists of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables SAGR.3 through SAGR.7). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table SAGR.8).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be

expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 3 – SAG RIVER (b) (7)(F), (b) (3)	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3)

Source

The leak occurs in a section of belowground pipe at Pipeline (b) (7)(F), (b) (3) . The failure occurs due to a longitudinal stress crack in the pipe. Pipe is leaking at a rate of 500 barrels per hour (bph). Mult ple simultaneous failures and manual control methods must be assumed to meet this release scenario.

Environmental Conditions

Time	1100	**Wind**	Calm
Season	Summer – June 5	**Seas**	N/A
Snow/Ice Coverage	None. River is in break-up. Ice is floating down the river and the river has expanded into the floodplain. The right-of-way (ROW) in the vicinity of check valve (CKV) 18 is underwater.	**Temperature**	45ºF
Visibility	No Precipitation	**Tide/Current**	4.0 – 5.5 mph

Environmental Considerations

The Sag River, from PLMP 81 north, is an anadromous fish stream. Waterfowl nest all along the Sag River. The Franklin Bluffs and Sagwon Bluffs are peregrine falcon nesting areas. The Beaufort Sea is also a sensitive area for fish and waterfowl. Environmental Sensitive Areas are further discussed in CP-35-1 Volume 3, Section 3.

Assumptions

1. Operations control center (OCC) shuts in the pipeline.
2. BL1 at Pump Station (PS) 3 is shut in.
3. CKV 17 and 18 automatically close.
4. Manual gate valve (MGV) 19A is manually closed by a Galbraith Maintenance Base responder.
5. The oil is moving about 5 mph.
6. Prudhoe Response Base responders are dispatched from Prudhoe Response Base.
7. Ga braith Maintenance Base responders are dispatched from Galbraith Maintenance Base.
8. Alaska Clean Seas (ACS) and the North Slope Mutual Aid teams are placed on standby.
9. In situ burn application is approved by the FOSC and SOSC.

SCENARIO 3 – SAG RIVER
(b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1, Volume 1, Section 1.7	Oil removal through in-situ burning, helitorching.	Volume 1, Section 3.6
Volume 3, Sections 4.1, 4.3 and 5.1	Offshore Containment and Recovery	Volume 1, Section 3.6 and Volume 3, Sections 4.1 and 4.3
Volume 3, Section 4.5.6.8	Burn Residue Collection	Volume 1, Section 3.6

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan."

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. Transient Volume Balance (TVB) leak detection system goes into alarm at 1100 hours on June 5. Alarm is monitored for 30 minutes but fails to clear.
    a. A Galbraith Maintenance Base responder flies in the Galbraith Maintenance Base/PS04 helicopter to conduct a reconnaissance of Section 2.
    b. All pump stations are notified of potential leak in Section 2 by OCC.
    c. The responder verifies that oil is surfacing in the Sag River, just north of CKV 18 and notifies the Prudhoe Response Base Pipeline and Civil Maintenance Coordinator (P&CM).
    d. The Pump Station One Operations and Maintenance Supervisor (O&M) assumes the position of Initial Incident Commander and the Prudhoe Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the O&M transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.
    e. Safety and security measures are initiated.
2. OCC shuts in the pipeline at 1300 hours. BL1 at PS03 is shut in to reduce drainback. CKV 17 and 18 automatically close on backflow of oil and isolate the leak.
3. The Ga braith Maintenance Base responder flies to PS03, picks up a power-actuated tool, and then returns to MGV 19A in the helicopter and manually closes the valve.
4. ACS and the North Slope Mutual Aid teams are placed on standby. Mobilization is by phone call to ACS.
5. At 1430 hours, Alaska Clean Seas (ACS) is requested to mobilize a helitorching operation to the former PS02 pad. The Safety Officer from Prudhoe Response Base is mobilized to meet the ACS crew at the former PS02 pad. The Air Monitoring task force is mobilized to the former PS02 pad for transport to the in situ burn site.
6. Upon successful closure of MGV 19A (1500 hours), the Ga braith Maintenance Base responder conducts an aerial reconnaissance of the river and identifies the leading edge of the oil at approximately PLMP 67 with the oil moving about 5 miles per hour. The Galbraith Maintenance Base responder also does an assessment of the river and determines that there are no suitable locations for initiating a mechanical containment and recovery operation, due to high water levels, moving ice, and river velocities.

SCENARIO 3 – SAG RIVER
(b) (7)(F), (b) (3)

7. Two crews, each with two people, are dispatched from Prudhoe Response Base; two crews, each with two people, are dispatched from Galbraith Maintenance Base to open the bypass valves on CKV 1 through CKV 17, inclusive. The manual gate valves at 5A, 10A, and BL1 and 2 at PS02 are left open to allow oil to drain back into PS01. This is completed by 1700 hours. The helicopter located at Prospect Response Base/PS05 is repositioned to the former PS02 pad and arrives at 1700 hours.
8. The helitorch equipment and personnel, and air monitoring personnel arrive at the former PS02 pad at 1730 hours.
9. Two 40-pound fire extinguishers are kept readily available at the former PS02 pad helitorch mixing/loading operation.
10. By 1730, no further oil is coming from the pipeline crack. Immediate planning commences for gaining access to the site and repairing the pipeline.
11. By 1930 hours, pockets of oil are discovered along the east bank of the Sag River in some side channels up to 3 miles downstream of the spill. Air monitoring commences. The pockets of oil are successfully ignited and it is estimated that 180 barrels of oil are removed through in-situ burning. By 2200 hours, helitorching operations are suspended.
12. By 2230, the burn residue collection task force is collecting burn residue and placing in drums or plastic bags.
13. Due to high water levels, moving ice and river velocities, mechanical containment and recovery operations are not feasible in the Sag River. The estimated time of arrival (ETA) of the oil into the Beaufort Sea is determined to be 0600 hours on June 6.
14. ACS is requested to mobilize and deploy mechanical containment and recovery operations in the Beaufort Sea for the early morning of June 6. Alaska Clean Seas is in the middle of preparing their boats for the open water season, but have not yet launched them. Eight ACS technicians/mechanics work through the night to prepare two offshore systems for deployment.
15. By 0500 hours, the equipment is manned by 12 fresh ACS technicians/Mutual Aid personnel and deployed. The first system is stationed immediately east of the Endicott Causeway to capture any oil that might come down the main channel of the Sag River. The second system is positioned between Howe Island and Heald Point to capture oil coming down the western channel of the Sag River.
16. At 0500 hours, an Alyeska helicopter overflight reveals no sign of oil either in the Sag River or the Beaufort Sea. The ACS vessels stay on station throughout the day with hourly overflights, but do not see any oil.
17. During the days that follow, cleanup activities focus on the oil remaining along the shorelines of the Sag River. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata.

Oil Trajectory

Oil is surfacing in the Sag River, just north of CKV 18. At 1500 hours on June 5, the leading edge of the oil is at approximately PLMP 67 with the oil moving about 5 miles per hour. By 1730, no further oil is coming from the pipeline crack. By 1830 hours, the leading edge of the oil has reached Franklin Bluffs. Pockets of oil are discovered along the east bank of the Sag River in some side channels up to 3 miles downstream of the spill. At 0500 hours on June 6, an Alyeska helicopter overflight reveals no sign of oil either in the Sag River or the Beaufort Sea.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"* or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities would likely take place and some of the initial tactics would continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

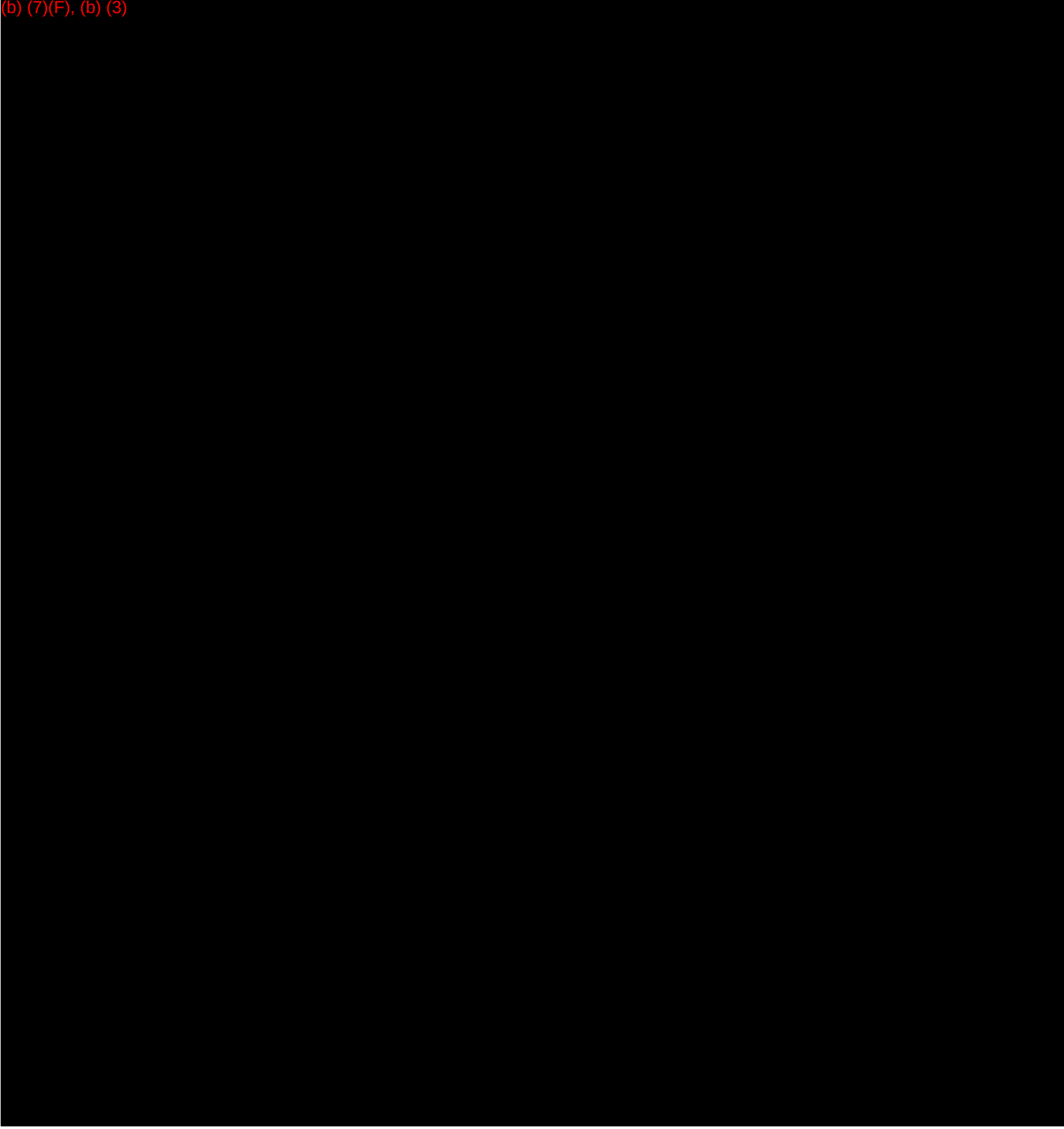


FIGURE SAGR.1
SAG RIVER SCENARIO MAP

(b) (7)(F), (b) (3)

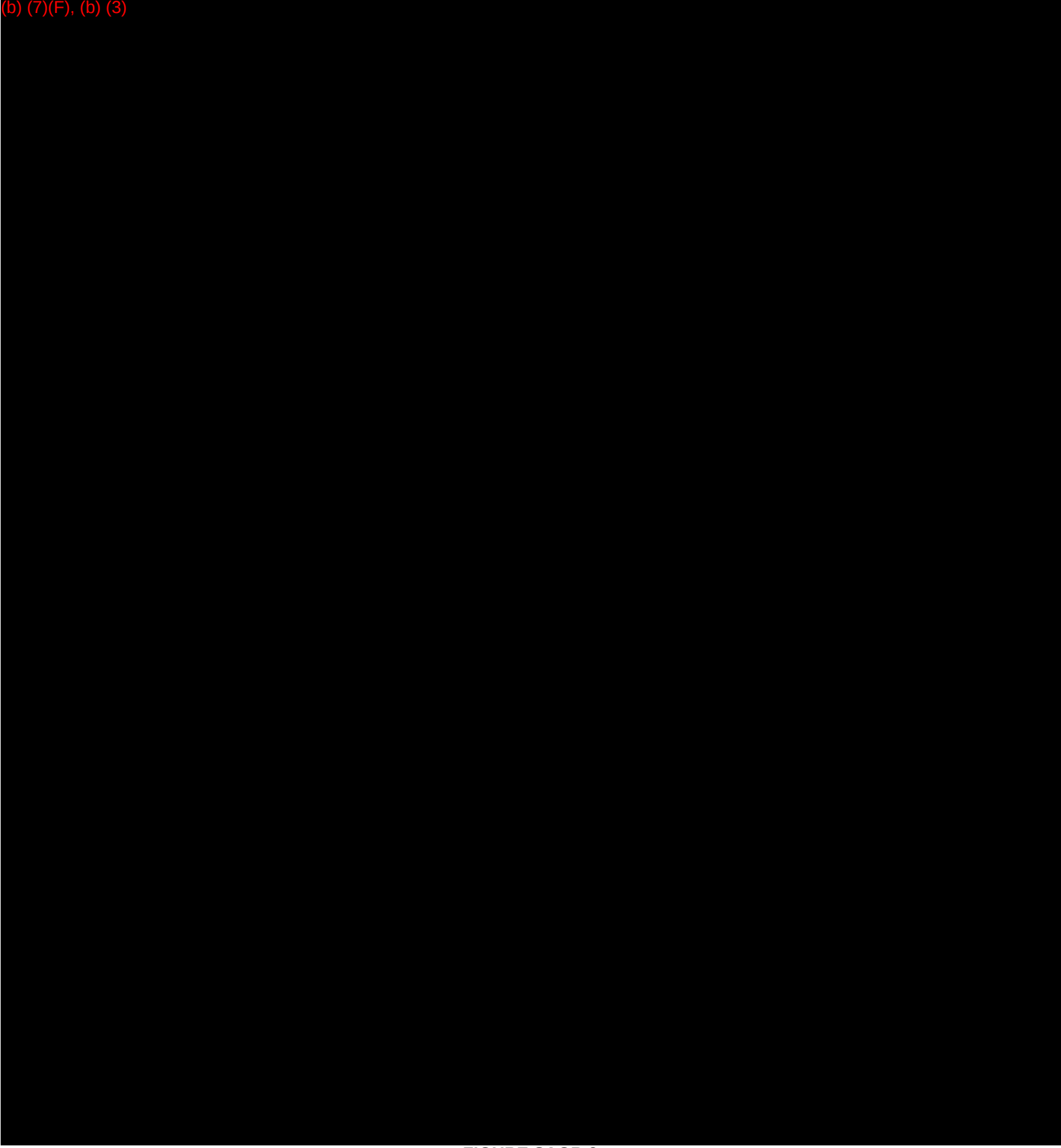


FIGURE SAGR.2
SAG RIVER SCENARIO DEPLOYMENT MAP

TABLE SAGR.1 SAG RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-8 Day 1 (1600-1900)	Night Shift (Hour 8-19) Day 1 (1900-2400); Day 2 (0000-0600)
Situation/Status • Weather • Environmental	Summer season. Winds calm. Temperature 45ºF.	Oil escapes from the pipeline at a rate of 500 bph. By the time the spill source is controlled, a total of 1,500 barrels is spilled.		By 1730 hours no further oil is coming from the pipeline crack. The pipeline in the area of the crack is not readily accessible. Immediate planning commences for gaining access to the site and repairing the pipeline.	
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site Security: Safety, site control, surveillance	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, develop and implement leading edge tracking. Protect life safety.			
	Cleanup and countermeasures, on land	Investigate cause, stop source if safe. Contain on land if possible. Prepare to shut in the pipeline, redirect oil flow away from facilities. Minimize the outflow/loss of oil from the pipeline.			
	Cleanup and countermeasures, on water	Deploy task forces and mobilize resources to maximize containment and recovery. Contain as near to pipeline as possible. Use non-mechanical response methods to restrict the spread of oil in the Sag River (in-situ burning). Contain and recover oil at the mouth of the Sag River.			
	Protection of sensitive resources and wildlife	Protect anadromous fish. Protect Peregrine Falcon and waterfowl nesting habitat. Initiate ESA identification and prioritization process. The Sag River from 81 north is an anadromous fish stream. The Franklin Bluffs and Sagwon Bluffs are peregrine falcon nesting areas. The Beaufort Sea is also a sensitive area for fish and waterfowl. Protect sensitive areas and wildlife.			
	Agency and stakeholder notification	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	A Ga braith Maintenance Base responder conducts an initial site safety assessment while conducting a reconnaissance of Section 2 as described below. The information is radioed to the Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site.	The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is > 20%, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck(S), wheeled 150-pound extinguishers, and hand-held extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations is conducted from outside the hot zone to control advanced exterior fires utilizing high volume handlines. The primary mission of firefighters is personnel safety and protection. The Prudhoe Response Base Safety Officer is requested to mobilize to the former PS02 pad by 1700 to assist TF-1.		Safety: Prudhoe Response Base Safety Officer arrives at the former PS02 pad by 1700 hours, prior to the ACS Helitorch equipment and personnel, and accompanies ACS on the helicopter. The Safety Officer conducts a site safety analysis using the “Site Safety and Control Analysis” (Form ICS 201-5) to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. Two 40-lb fire extinguishers are kept readily available at the Helitorch mixing/loading operation at the former PS02 pad.	
Discharge Tracking	Aerial tracking is done visually by helicopter. Ground observations are made by operations personnel who conduct source control actions..	The frequency of oil trajectory observations are almost continuous during the initial hours of the response. Incident Commander tracks discharge on a situation status map. Incident Command Staff formulate or adjust incident objectives, define strategies, and prioritize actions.	Tracking reports are made to the Incident Command Center via radio on an hourly basis at least.		As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.
Protection of Environmentally Sensitive Areas (ESAs)	The Sag River, from PLMP 81 north, is an anadromous fish stream. Waterfowl nest all along the Sag River. The Franklin Bluffs and Sagwon Bluffs are peregrine falcon nesting areas. The Beaufort Sea is also a sensitive area for fish and waterfowl.				

TABLE SAGR.1 (CONTINUED) SAG RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-8 Day 1 (1600-1900)	Night Shift (Hour 8-19) Day 1 (1900-2400); Day 2 (0000-0600)
Source Control and Response Actions	TVB leak detection system goes into alarm at 1100 hours. Alarm is monitored for 30 minutes but fails to clear. PS01 is notified of possible leak in Section 2 and requested to conduct a reconnaissance by the Operations Control Center (OCC). All pump stations are notified of potential leak in Section 2 by the OCC. A PS04 responder flies in the Galbraith Maintenance Base/PS04 helicopter to conduct a reconnaissance of Section 2. The responder verifies that oil is surfacing in the Sag River, just north of CKV 18 and notifies the Prudhoe Response Base P&CM. The responder also conducts an initial site safety assessment as described above.	OCC shuts in the pipeline at 1300 hours. BL1 at PS03 is shut in to reduce drainback. CKV 17 and 18 automatically close on backflow of oil and isolate the leak. The Prudhoe Response Base responder flies back to PS03 and picks up a power-actuated tool and then flies back to MGV 19A in the helicopter and manually closes the valve. Two crews, each with two people, are dispatched from Prudhoe Response Base; two crews, each with two people, are dispatched from Galbraith Maintenance Base, to open the by-pass valves on check valves 1 through 17 inclusive. The manual gate valves at 5A, 10A and BL1 and 2 at PS02 are left open to allow oil to drain back into PS01.	Upon successful closure of MGV 19A (1500 hours), a responder conducts an aerial reconnaissance of the river and identifies the leading edge of the oil at approximately PLMP 67 with the oil moving about 5 miles per hour. The responder also does an assessment of the river and determines that there are no suitable locations for initiating a mechanical containment and recovery operation, due to high water levels, moving ice, and river velocities.	The Prudhoe Response Base and Galbraith Maintenance Base crews that are opening valves complete this effort at 1700 hours.	
	The Pump Station One O&M assumes the position of Initial Incident Commander and the P&CM assumes the position of Operations Section Chief. As soon as is practicable, the O&M transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks	Because of the multiple response operation sites along the Sag River and into the Beaufort Sea, it is expected that up to three portable radio repeater sets need to be deployed. Initial repeater relay capability would be supplied by strategic positioning of radio-equipped Alyeska vehicles. A Communication Plan would be developed and issued with the first and subsequent Incident Action Plans	The Incident Commander issues the following incident objectives: • Protect life safety. • Minimize the outflow/loss of oil from the pipeline. • Use non-mechanical response methods to restrict the spread of oil in the Sag River (in-situ burning). Contain and recover oil at the mouth of the Sag River.		
	The Fairbanks Duty Officer is notified by OCC and in turn notifies the Pipeline Manager (VP).				
	Aerial observations are reported to the Incident Command Center via radio on an hourly basis at least. Because of the close proximity of the response operations, radio communications are conducted over handheld and vehicle/boat radios. An incident Communications Plan is developed and implemented as part of the first and subsequent, Incident Action Plan(s). Portable radio repeater(s) may be required if response operations sites are needed further down river. The Incident Commander, the Federal On-Scene Coordinator, and the State On-Scene Coordinator continuously monitor the response organizations' performance in achieving the incident objectives. Adjustments to the objectives and supporting tactics will be made as needed throughout the course of the response. Mechanical containment and recovery tactics may be more successful as the ice in the Sag River and the water flow reduces.				
Task Force 1 (Helitorching Operation) **Task Force 3** **(Air Monitoring of In Situ Burn Operation)**		Alaska Clean Seas (ACS) and the North Slope Mutual Aid teams are placed on stand-by. Mobilization is by phone call to ACS.	At 1430 hours, ACS mobilizes a helitorching operation to the former PS02 pad. Air monitoring personnel are mobilized for surveillance of the in situ burn operation.	The helicopter located at Prospect Response Base/PS05 is repositioned to the former PS02 pad and arrives at 1700 hours. The Helitorch equipment and personnel arrive at the former PS02 pad at 1730 hours. The air monitoring personnel arrive at the former PS02 pad at 1730 hours for deployment to the in situ burn site. By 1830 hours the leading edge of the oil has reached Franklin Bluffs.	By 1930 hours, the Helitorch is ready to fly. Permits for in situ burning have been received from the FOSC and SOSC. The air monitoring task force is ready to begin surveillance of the in-situ burn operations. Pockets of oil are discovered along the east bank of the Sag River in some side channels up to 3 miles downstream of the spill. These are successfully ignited and it is estimated that 180 barrels of oil are removed through in-situ burning. By 2200 hours, helitorching operations are suspended. By 2230 the Site Safety Officer determines the burn residue has cooled so there is no danger of flashback. Burn residue collection task forces collect the residue and place in drums or plastic bags for temporary storage.

TABLE SAGR.1 (CONTINUED) SAG RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-8 Day 1 (1600-1900)	Night Shift (Hour 8-19) Day 1 (1900-2400); Day 2 (0000-0600)
Task Force 2 **(Mechanical Containment and Recovery)**	Due to high water levels, moving ice and river velocities, mechanical containment and recovery operations are not feas ble in the Sag River.				ACS is requested to mobilize and deploy mechanical containment and recovery operations in the Beaufort Sea for the early morning of June 6. Alaska Clean Seas is in the middle of preparing their boats for the open water season, but have not yet launched them. Eight ACS technicians/mechanics work through the night to prepare two offshore systems for deployment. By 0500 hours, the equipment is manned by 12 fresh ACS technicians/Mutual Aid personnel and deployed. The first system is stationed immediately east of the Endicott Causeway to capture any oil that might come down the main channel of the Sag River. The second system is positioned between Howe Island and Heald Point to capture oil coming down the western channel of the Sag River. By 0500 hours an Alyeska helicopter overflight reveals no sign of oil either in the Sag River or the Beaufort Sea. The ACS vessels stay on station throughout the day with hourly overflights, but do not see any oil. At 0500 hours an Alyeska helicopter overflight reveals no sign of oil either in the Sag River or the Beaufort Sea. The ACS vessels stay on station throughout the day with hourly overflights, but do not see any oil.
Waste Management		Solid waste is segregated in clear bags: 1. Waste to landfill 2. Oily waste 3. Heavily oily waste Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil is stockpiled in an approved lined secondary containment area at the former PS02 pad. This soil will be thermally remediated on site.			
Wildlife Protection / Rehabilitation	Environment Unit takes the following steps: 1. ACS is requested to provide 5 wildlife hazers. The Environmental Coordinator (EC) is mobilized from PS01 to PLMP 67 to meet the ACS hazers and oversee hazing operations. 2. The Alaska Clean Seas Wildlife response center on the North Slope is made operational 3. The Alyeska wildlife facilities at Fairbanks and Valdez are placed on standby.			The EC and the ACS hazers arrive at PLMP 67. Environment Unit takes the following steps: The International Bird Rescue Research Center (IBRRC) is notified and requested to mobilize a full scale hazing operation as well as a capture and stabilization operation. This includes making the Anchorage wildlife facility operational. The IBRRC is on location within 24 hours and takes over coordination of the overall wildlife response operation.	

TABLE SAGR.1 (CONTINUED) SAG RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day/Night Shift Day 2 (0600-2400); Day 3 (0000-0600)	Day/Night Shift Day 3 (0600-2400); Day 4 (0000-0600)	Day/Night Shift Day 4 (0600-2400); Day 5 (0000-0600)	Day Shift+ Day 5 (0600+)
Situation/Status • Weather • Environmental			After approximately 4 days, the Sag River begins to recede.	
Response Actions			A shoreline survey is organized to delineate those portions of the Sag River that have stranded oil on them	
Wildlife Protection	The IBRRC arrives on-site and takes over coordination of wildlife activities.			
Task Force 2 **(Mechanical Containment and Recovery)**				
Shoreline Cleanup Plan			During the days that follow, cleanup activities focus on the oil remaining along the shorelines of the Sag River. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. Oiled gravel on the workpad is stored in a temporary lined area for later cleaning or incineration and reuse. The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel, eroding tundra scarp, sand and gravel missed with peat, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge with recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are utilized to recover deeper pools of oil when poss ble. Oiled peat slurries are removed by small loaders and transported to stable areas for cleaning. Peat outcrops will be raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques.	Mobilization of equipment and personnel (combination ACS/PPC) for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about 2 weeks, the shoreline cleanup crews recover about one-half of the oil volume estimated to remain on shore after initial recovery efforts are completed. This initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations of resources and other organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE SAGR.2 SAG RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							Hour 3-5 1400-1600						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1--	-1-	--	1 helicopter (1)	--	--	--	--	1	--	1 - helicopter[4] (1)	--	--	--	--	1	--	1 - helicopter[4] (1)	--	--	--	--
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--
Safety	Site Safety and Control[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Response Actions	Helitorching Operation	TF-1	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--
	Mechanical Containment and Recovery	TF-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Air Monitoring	TF-3	--	--	--	--	--	--	--	--		--	--	--	--	--	--	2	--	--	--	--	--	--
	Burn Residue Collection	TF-4	--	--	--	--	--	--	--	--		--	--	--	--	--	--	4	--	Raft kit (2)	--	--	--	--
Wildlife	Wildlife Hazing	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--		--	--	--	--	--	--	3 portable radio repeater sets	--	--	--	--	--	--	3 portable radio repeater sets	--	--	--	--
Source Control	Close Valves		--	--	--	--	--	--	--	--	8	--	--	--	--	--	--	8						
Personnel Total			Note[7]	1	0	1					9	0	1					15	0	3				
Mechanical Equipment Total					0	1						0	1						0	3				

TABLE SAGR.2 (CONTINUED) SAG RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							Hour 3-5 1400-1600						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1	1	--	1 helicopter[4] (1)	--	--	--	--	1	--	1 helicopter[4] (1)	--	--	--	--	1	--	1 helicopter[4] (1)	--	--	--	--
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	2 ea. 40-lb fire extinguisher	--	--	--	--	--	--	2 ea. 40-lb fire extinguisher	--	--	--	--	--	--	2 ea. 40-lb fire extinguisher	--	--	--	--
Safety	Site Safety and Control[6]	--	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
	Helitorching Operation	TF-1	2	2	--	1 ea. 55-gallon Helitorch 1 spare 55-gallon drum 1 ea. 280-gallon gelled fuel mixer 200-lb gelling agent 1 A/G radio 1 tool kit 1 helicopter (1)	--	--	--	--	2	--	1 ea. 55-gallon Helitorch 1 spare 55-gallon drum 1 ea. 280-gallon gelled fuel mixer 200-lb gelling agent 1 A/G radio 1 tool kit 1 helicopter(1)	--	--	--	--	2	--	1 ea. 55-gallon Helitorch 1 spare 55-gallon drum 1 ea. 280-gallon gelled fuel mixer 200-lb gelling agent 1 A/G radio 1 Tool kit 1 helicopter (1)	--	--	--	--
	Mechanical Containment and Recovery	TF-2	--	--	--	--	--	--	--	--	12-	--	Vessel Big Dipper (3)[8] Vessel Fireweed (2)[8] Vessel Arctic Rose (2)[8] 1000-ft Nordan boom 2 ea. 249 barrel mini barges 500-ft Goodyear ocean boom Vessel Agviq (3)[8] Vessel Deployer (2)[8] 2 Lori brush skimmers Desmi 250 skimmer	2 1	54 ea. 126	4 mini barges	249 ea.	12	--	Vessel Big Dipper (3)[8] Vessel Fireweed (2)[8] Vessel Arctic Rose (2)[8] 1000-ft Nordan boom 2 ea. 249 barrel mini barges 500-ft Goodyear ocean boom Vessel Agviq (3)[8] Vessel Deployer (2)[8] 2 Lori brush skimmers Desmi 250 skimmer	2 1	54 ea. 126	4	249 ea.

TABLE SAGR.2 (CONTINUED) SAG RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							Hour 3-5 1400-1600						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Safety (Continued)	Air Monitoring	TF-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--
	Burn Residue Collection	TF-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--
Wildlife	Wildlife Hazing	--	5 ACS	5 ACS	--	--	--	--	--	--	5 ACS	--	--	--	--	--	--	5 (plus IBRRC)	--	--	--	--	--	--
On Scene Comms.	Communications Support	Comms.	--	--	--	3 portable radio repeater sets	--	--	--	--	--	--	3 portable radio repeater sets	--	--	--	--	--	--	3 portable radio repeater sets	--	--	--	--
Source Control	Close Valves		8	8	--	--	--	--	--	--	8	--	--	--	--	--	--	8	--	--	--	--	--	--
Personnel Total			Note[7]	17	0	2					29	0	14					26	0	14				
Mechanical Equipment Total					0	4						0	14						0	14				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the “People for Ops” column.

– Not arrived on site. May be mobilized or en route.

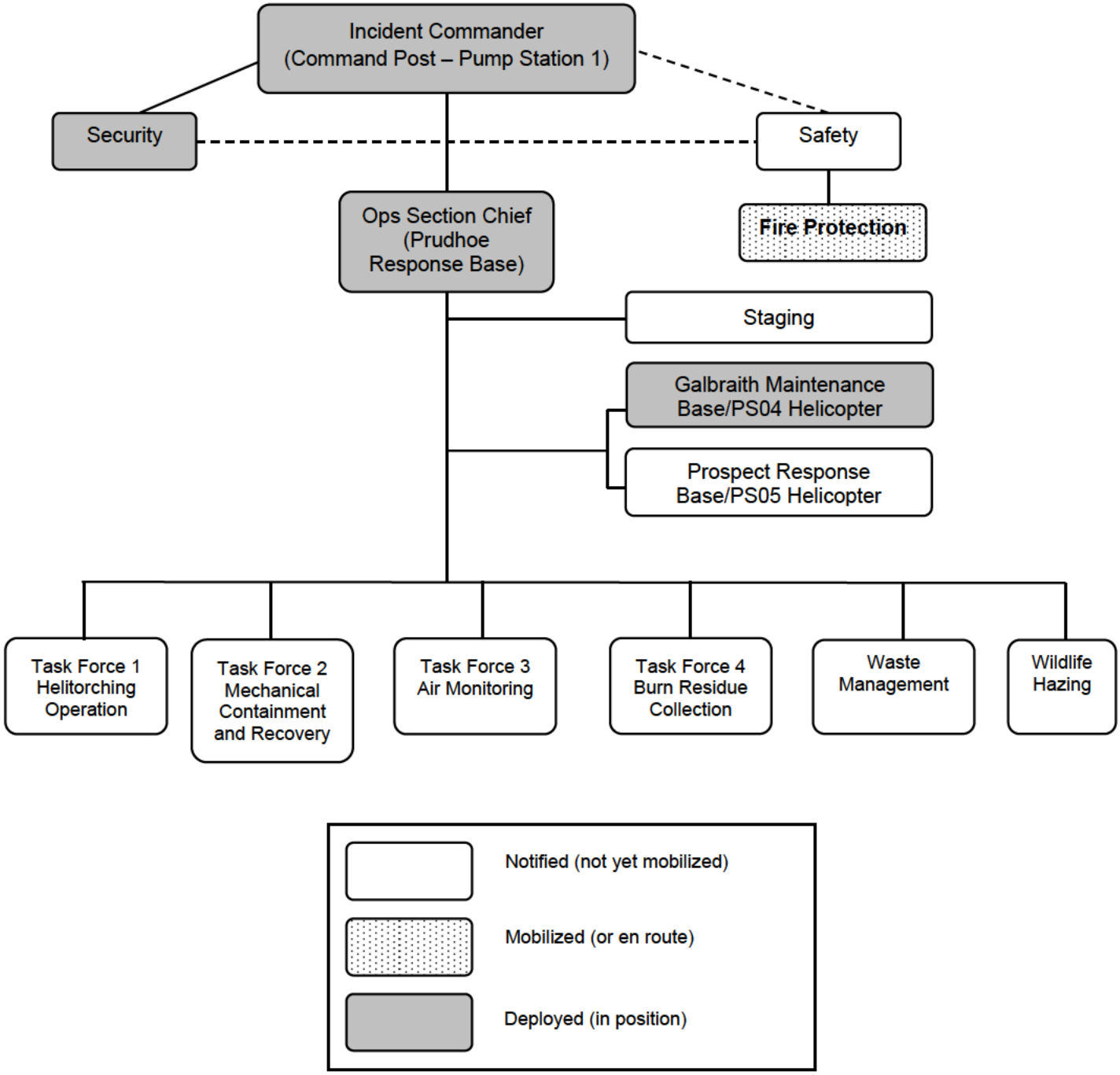


FIGURE SAGR.3
SAG RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

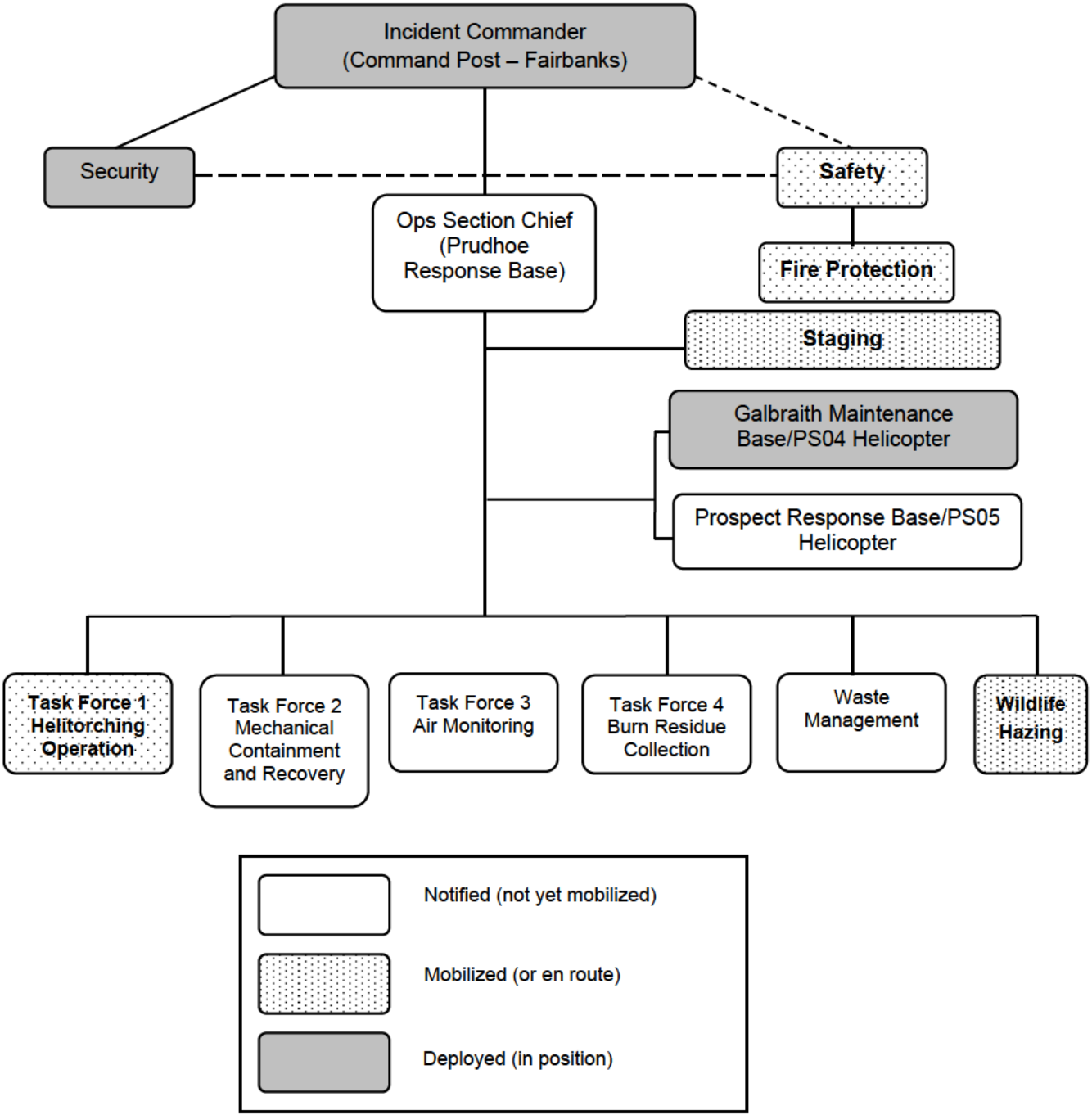


FIGURE SAGR.4
SAG RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

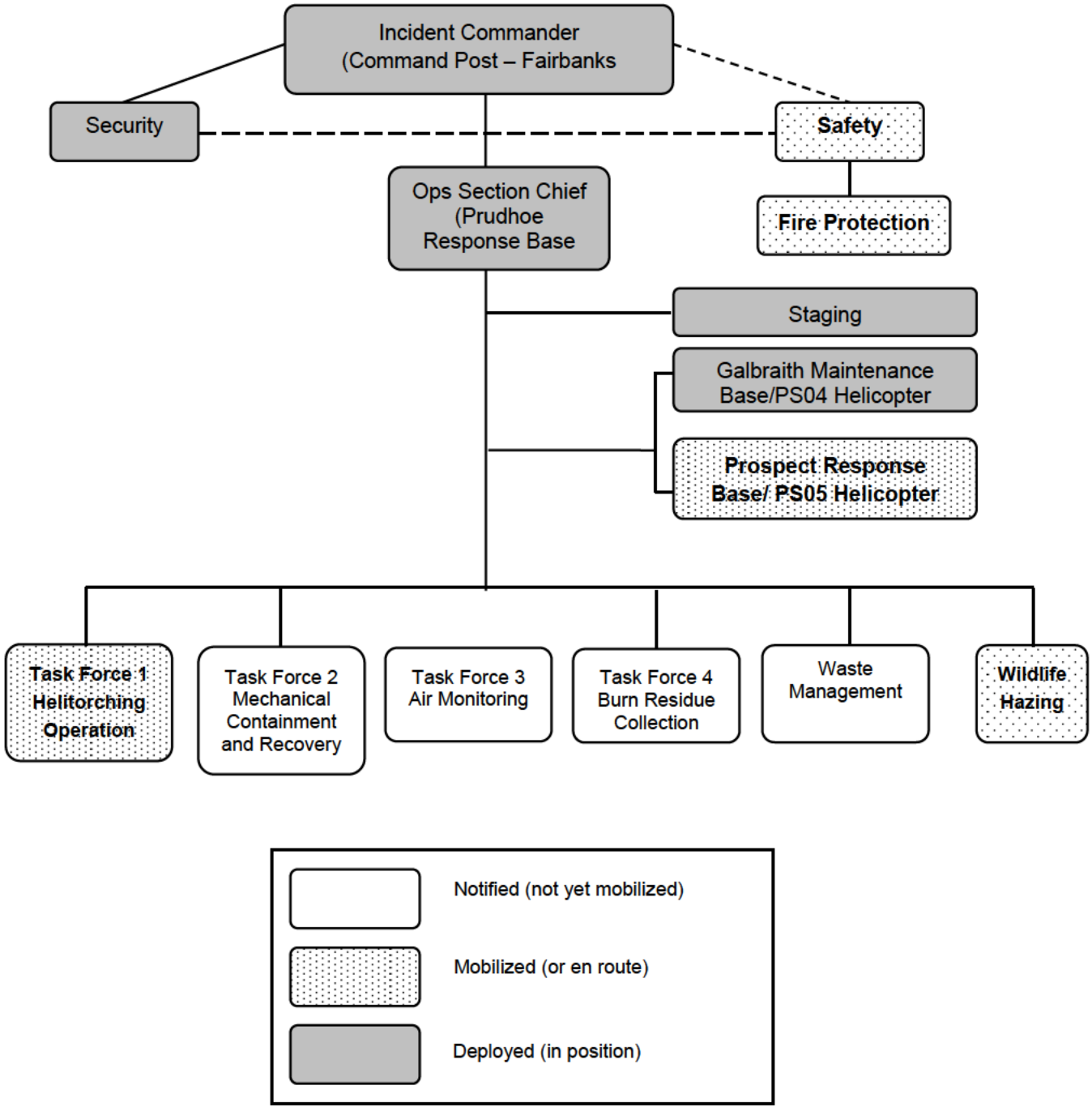


FIGURE SAGR.5
SAG RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-5

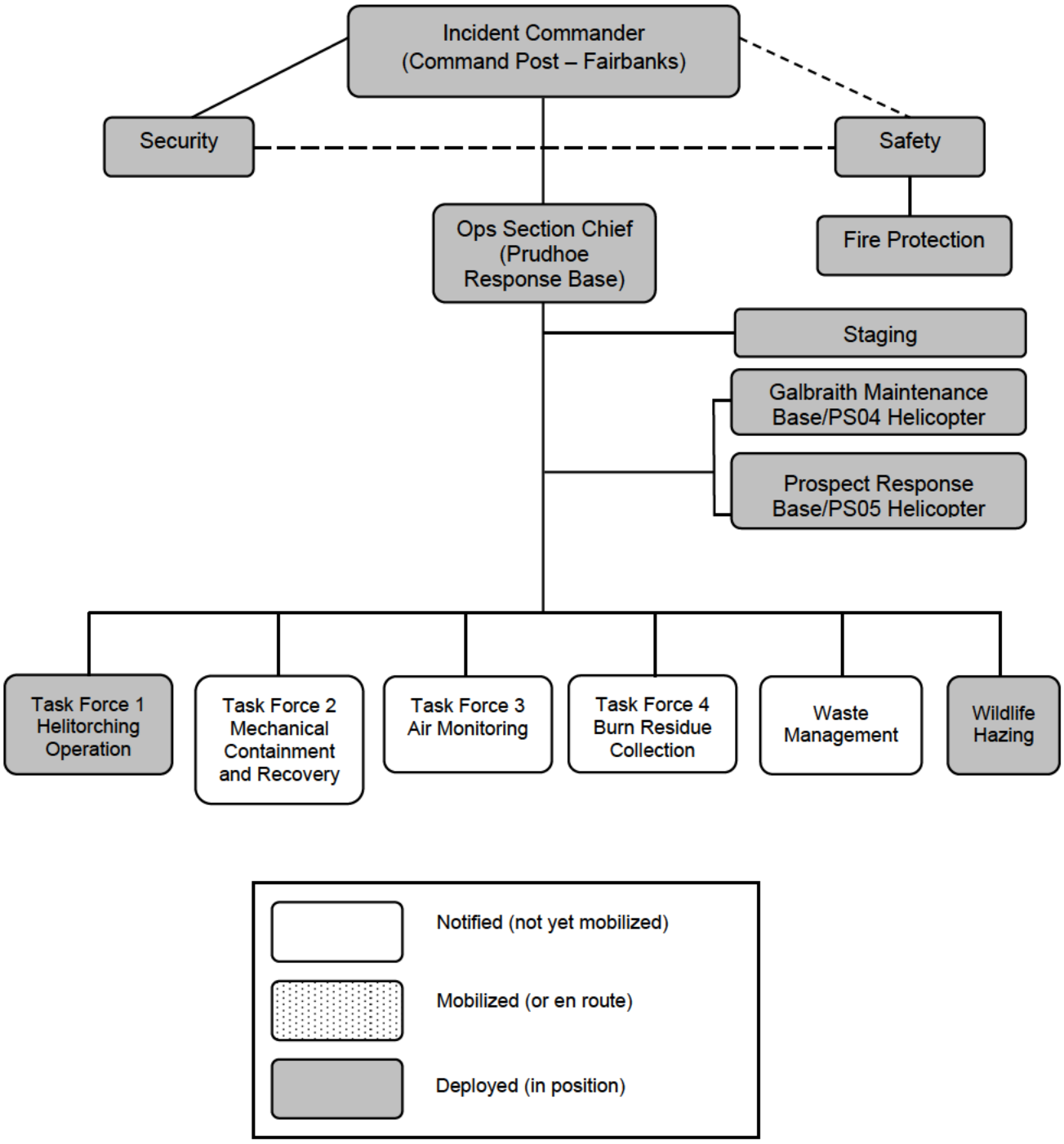


FIGURE SAGR.6
SAG RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 5-8

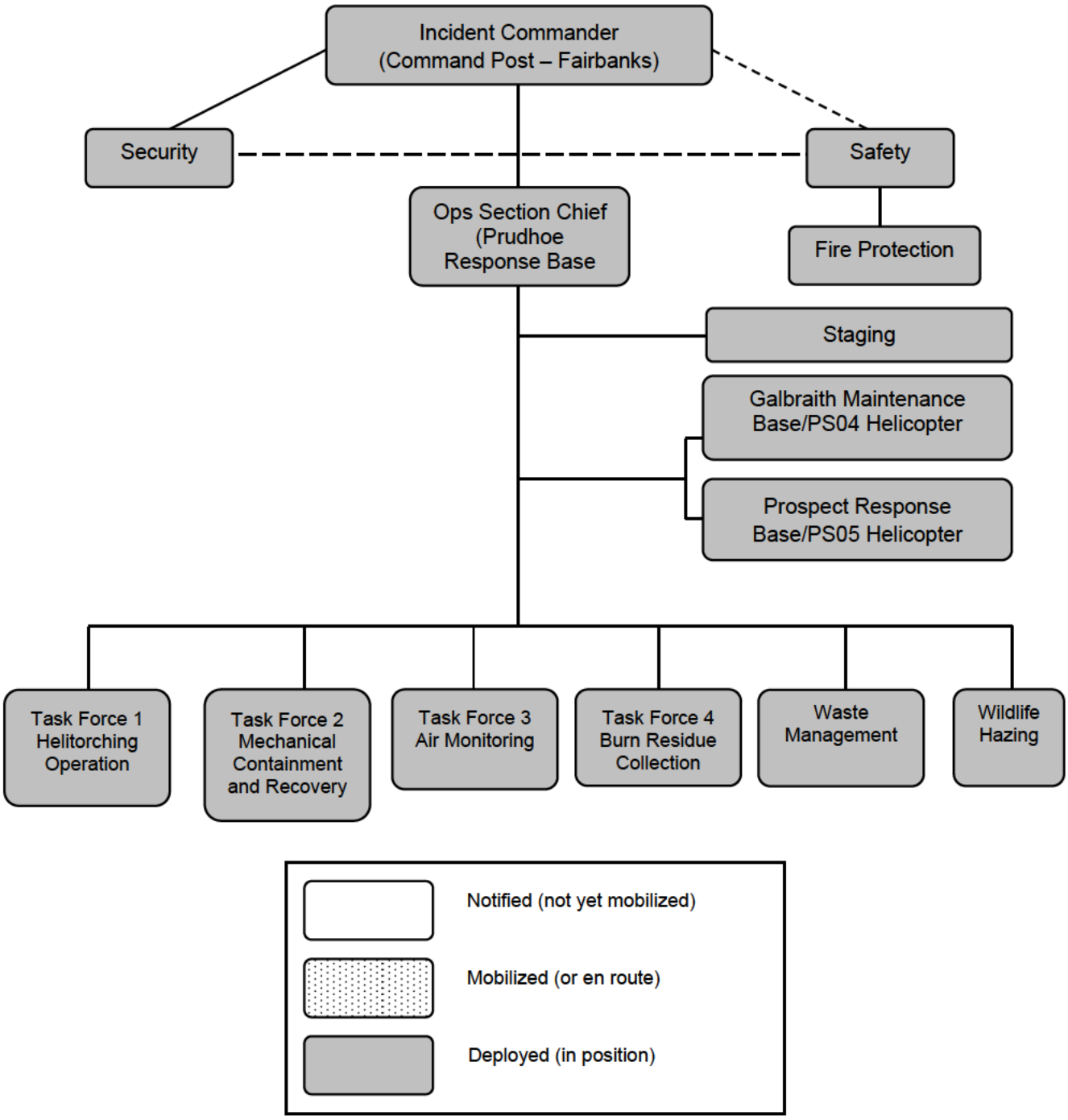


FIGURE SAGR.7
SAG RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 8+

TABLE SAGR.3 SAG RIVER SCENARIO
MANPOWER AND EQUIPMENT MOBILIZATION TABLE – AERIAL RECONNAISSANCE AND SOURCE CONTROL

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Helicopter - Air Logistics	Galbraith Maintenance Base/PS04	Aerial reconnaissance	T + 0.5 hr
Ga braith Maintenance Base Responder (1)	Galbraith Maintenance Base	Aerial reconnaissance and closure of MGV 19A	T + 0.5 hr
Prudhoe Response Base Responders (4)	Prudhoe Response Base	To work with Galbraith Maintenance Base responders in opening the bypass valves on CKV 1 through CKV 17	T + 2 hr
Ga braith Maintenance Base Responders (4)	Galbraith Maintenance Base	To work with Prudhoe Response Base responders in opening the bypass valves on CKV 1 through CKV 17	T + 2 hr

TABLE SAGR.4 SAG RIVER SCENARIO
TASK FORCE 1: MANPOWER AND EQUIPMENT MOBILIZATION TABLE – HELITORCHING OPERATION

Equipment/Personnel (Quantity)	Location	Purpose	ETA to former PS02 Pad
55-gallon Helitorch (1)	Prudhoe Bay (ACS)	Igniting oil	T + 6.5 hr
Spare 55-gallon drum for Helitorch (1)	Prudhoe Bay (ACS)	Reduce turn-around time for loading Helitorch	T + 6.5 hr
280-gallon gelled fuel mixer (loaded with diesel) (1)	Prudhoe Bay (ACS)	Expedite mixing and loading time for Helitorch	T + 6.5 hr
200 pounds of gelling agent	Prudhoe Bay (ACS)	Powder to make gel	T + 6.5 hr
40- b fire extinguishers (2)	Prudhoe Bay (ACS)	Incipient firefighting	T + 6.5 hr
A/G radio (1)	Prudhoe Bay (ACS)	Communication with helicopter	T + 6.5 hr
Tool kit (1)	Prudhoe Bay (ACS)	Make repairs as necessary	T + 6.5 hr
ACS Technicians (2)	Prudhoe Bay (ACS)	Mix and load Helitorch	T + 6.5 hr
Helicopter - Air Logistics	Prospect Response Base/PS05	Helitorching	T + 6 hr

TABLE SAGR.5 SAG RIVER SCENARIO
TASK FORCE 2: MANPOWER AND EQUIPMENT REQUIREMENTS – OFFSHORE CONTAINMENT AND RECOVERY

System 1 (Alaska Clean Seas)		
Vessel Big Dipper		
Lori Brush Skimmers (port and starboard sides)		Derated capacity (20%) of 54 bph
Vessel Fireweed		
Vessel Arctic Rose		
1,000 ft of Nordan boom (24-inches by 36-inches)		
249 barrel mini-barges (2)		
4 ACS technicians/mechanics work through the night to prepare offshore system for deployment		
7 ACS/Mutual Aid crew members deployed as follows:	Big Dipper (3) Fireweed (2) Arctic Rose (2)	
This system would be configured with the Fireweed and Arctic Rose running a concentrated boom system with a swath width of about 330 feet. Oil would be dropped back in to the Lori side collector systems and then pumped to a mini-barge being towed behind the Big Dipper.		
System 2		
Vessel Agviq		
Vessel Deployer		
Desmi 250		Derated capacity (20%) of 126 bph
500 ft of Goodyear ocean boom (14-inches by 24-inches)		
249 barrel mini-barges (2)		
4 ACS technicians/mechanics work through the night to prepare offshore system for deployment		
5 ACS/Mutual Aid crew members deployed as follows:	Agviq (3) Deployer (2)	
This system would be configured in a J, with the Deployer running the wing of the J. Oil would be recovered out of the J by the Desmi 250 deployed off of the Agviq. Recovered oil would be pumped to a mini-barge, towed behind the Agviq.		

TABLE SAGR.6 SAG RIVER SCENARIO
TASK FORCE 3: MANPOWER AND EQUIPMENT MOBILIZATION TABLE – AIR MONITORING PERSONNEL

Equipment/Personnel (Quantity)	Location	Purpose	ETA to former PS02 Pad
Air Monitoring Personnel (2)	Prudhoe Bay Response Base	Monitor air quality	T + 7 hr

TABLE SAGR.7 SAG RIVER SCENARIO
TASK FORCE 4: MANPOWER AND EQUIPMENT MOBILIZATION TABLE – BURN RESIDUE COLLECTION

Equipment/Personnel (Quantity)	Location	Purpose	ETA to former PS02 Pad
Raft Kit(s)	Galbraith Maintenance Base	Burn residue collection	T + 6.5 hr
Large nets and handtools	Galbraith Maintenance Base	Burn residue collection	T + 6.5 hr
Drums and bags	Galbraith Maintenance Base	Burn residue temporary storage	T + 6.5 hr
Recovery Personnel (4)	Galbraith Maintenance Base	Recovery	T + 6.5 hr

TABLE SAGR.8 SAG RIVER SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table SAGR.8. The release occurs from an underground section of pipeline near the Sag River. Oil is contained in the soil and tundra in the vicinity of the spill, on the Sag River, and on the Sag River shorelines. Most of the oil enters the Sag River and is eventually deposited on the shorelines without reaching the Beaufort Sea; however 150 barrels of oil is removed from the Sag River through in-situ burning. Oil in the Sag River and on the shorelines is estimated to have an emulsification rate of 20 percent. The long-term response actions consisting of excavation and shoreline cleanup are expected to start more than 72 hours after the spill.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Cumulative Oil Recovered (bbl)						
			4 hr	12 hr	24 hr	48 hr	72 hr	Total	Remaining
Release point (in soil and tundra mat)	(b) (7)(F), (b) (3)								
Sag River									
Sag River shorelines									

Scenario 4. Dietrich River

10,000-Barrel Crude Oil Spill on Land to Water

This scenario depicts representative oil spill response activities for an oil spill resulting from corrosion of a belowground pipeline segment.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures DIET.1 and DIET.2)
3. Timeline matrix (Table DIET.1)
4. On-site resource tally sheet (Table DIET.2)
5. Response organization charts (Figures DIET.3 through DIET.6)
6. Resource mobilization tables (Tables DIET.3 through DIET.6)
7. Summary of oil fate and estimated recovery (Table DIET.7)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures DIET.1 and DIET.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table DIET.1). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table DIET.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures DIET.3 through DIET.6). The sixth component is comprised of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment location, and estimated time to mobilize the equipment to the spill site (Tables DIET.3 through DIET.6). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table DIET.7).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be

expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 4 – DIETRICH RIVER 10,000-Barrel Spill on Land	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	10,000 barrels (bbl) – crude oil

Source

The leak occurs in a section of belowground pipe. The failure occurs due to corrosion of the buried mainline pipe at Pipeline Milepost (PLMP) 181.2.

Environmental Conditions

Time	1100	**Wind**	10 mph, from E
Season	Winter – February 15	**Seas**	N/A
Snow/Ice Coverage	18 inches	**Temperature**	-20ºF
Visibility	Good – negligible precipitation	**Tide/Current**	River frozen in the vicinity of the right-of-way (ROW); flow velocity is zero.

Environmental Considerations – Dietrich River, Segment 3

The Dietrich River has critical overwintering habitat for Arctic grayling, Dolly Varden and round whitefish in the vicinity of the pipeline ROW at PLMP 181.

Raptor nest concentrations occur between PLMP 176 and 183.

Assumptions

1. The pipeline is shut in. Remote gate valve (RGV) 32 is closed and the RGVs from RGV 33 to PS05 are opened to allow this section of the pipeline to drain forward to PS05. The oil from Atigun Pass is drained into Tank 150 at PS05.

2. The P&CM, who assumes the position of Operations Section Chief, completes an initial assessment of the spill and radios it into the Galbraith Maintenance Base Maintenance Supervisor (MS).

3. The Ga braith Maintenance Base MS assumes the position of Initial Incident Commander. As soon as is practicable, the MS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.

SCENARIO 4 – DIETRICH RIVER
10,000-Barrel Spill on Land

Tactical Summary

Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Sections 4.5.7	Use front end loader for construction of a temporary storage site for contaminated soils and liquids	Volume 2, Table DIET.3
Volume 3, Section 4.1.1	Use D-8 Cat with ripper and backhoe to dig an interception trench and liquid containment ponds to contain oil	Volume 2, Table DIET.4
Volume 3, Sections 4.1.1 and 4.3.3	Recovery of spilled oil will be by use of multiple pumps, skimmers, portable oil containers, vacuum trucks	Volume 2, Table DIET.5

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table DIET.1, Dietrich River Scenario Timeline Matrix.)

Actions

Actions based on the above noted notifications, a number of simultaneous response actions begin.

1. Safety and security measures are initiated.

2. Galbraith Maintenance Base responders with equipment construct a temporary storage site for contaminated soils at PLMP 181.3 and contaminated liquids at (b) (7)(F), (b) (3) [redacted] (containment pond #1).

   The contaminated soils stockpile is located at PLMP 181.3 at a site identified downstream of where the oil is surfacing, between the highway and the ROW.

   Liquids containment pond #1 is located at (b) (7)(F), (b) [redacted] the Dalton Highway and the Dietrich River. This containment pond is constructed using snow berms and a 100- by 100-foot liner. The dimensions of the containment area are 80 by 80 by 6 feet, providing safe capacity for 5,700 barrels of liquid (completed by 2000 hours).

   An area for decontamination is set up by Galbraith Maintenance Base baseline contractor responders.

3. Dig an interception trench to contain oil.

   Six Prospect Response Base responders (TF-2) are mobilized along with equipment (Table DIET.4) to dig an interception trench just upstream of the surfacing oil. A survey crew from PS04 assists by locating the buried pipeline.

4. Begin recovery of crude oil from interception trench.

   Eight ACS responders (TF-3) with equipment (Table DIET.5) are mobilized to manage recovered oil and water.

5. Find the source of the leak.

   After TF-2 has completed the interception trench, they excavate the suspected leak area.

   The source of the leak is identified as corrosion and the Fairbanks Initial Response Team is mobilized to sleeve the pipeline.

SCENARIO 4 – DIETRICH RIVER
10,000-Barrel Spill on Land

6. Construction of dewatering pits.

   If groundwater at the site is not manageable, dewatering pits will be excavated upstream of the contaminated area and water will be pumped clear of the work area.

   The equipment and materials necessary for this operation are identified in Table DIET.6. Additional 6-inch and 10-inch dewatering pumps would be brought to the site as required for this operation.

7. Longer-term response actions.

   Alyeska begins immediate planning for the repair of the pipeline and recovery of free oil and oil contaminated soils.

   A 100-man camp is brought in and placed at MS-106-1 at (b) (7) . It takes 5 days to prepare the site, move the camp and get it operational. This is completed by February 20.

   A large scale earth removal operation is planned. Plans are made to bring in large earth-moving equipment for removal and segregation of contaminated and clean soils. A large containment site for contaminated soils (contaminated soils containment site #2) is established at MS-106-1. A soils burner is brought in to remediate the soil in the spring.

   Oil contaminated water is identified as a potential issue. A series of insulated holding tanks and an oil/water separator are brought in and set up for handling contaminated liquids. To minimize hauling distances, this is established in an area between the Dalton Highway and the Dietrich River at approximately (b) (7)

   Removal of oiled gravels and free oil and backfilling of the pipeline ditch is planned for completion prior to spring breakup.

Oil Trajectory

A P&CM discovers crude oil in aufeis at (b) (7)(F), while conducting surveillance.

The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking will be done by air, on the ground, or both.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"* or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn, depends primarily on how much land and resources are affected, and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

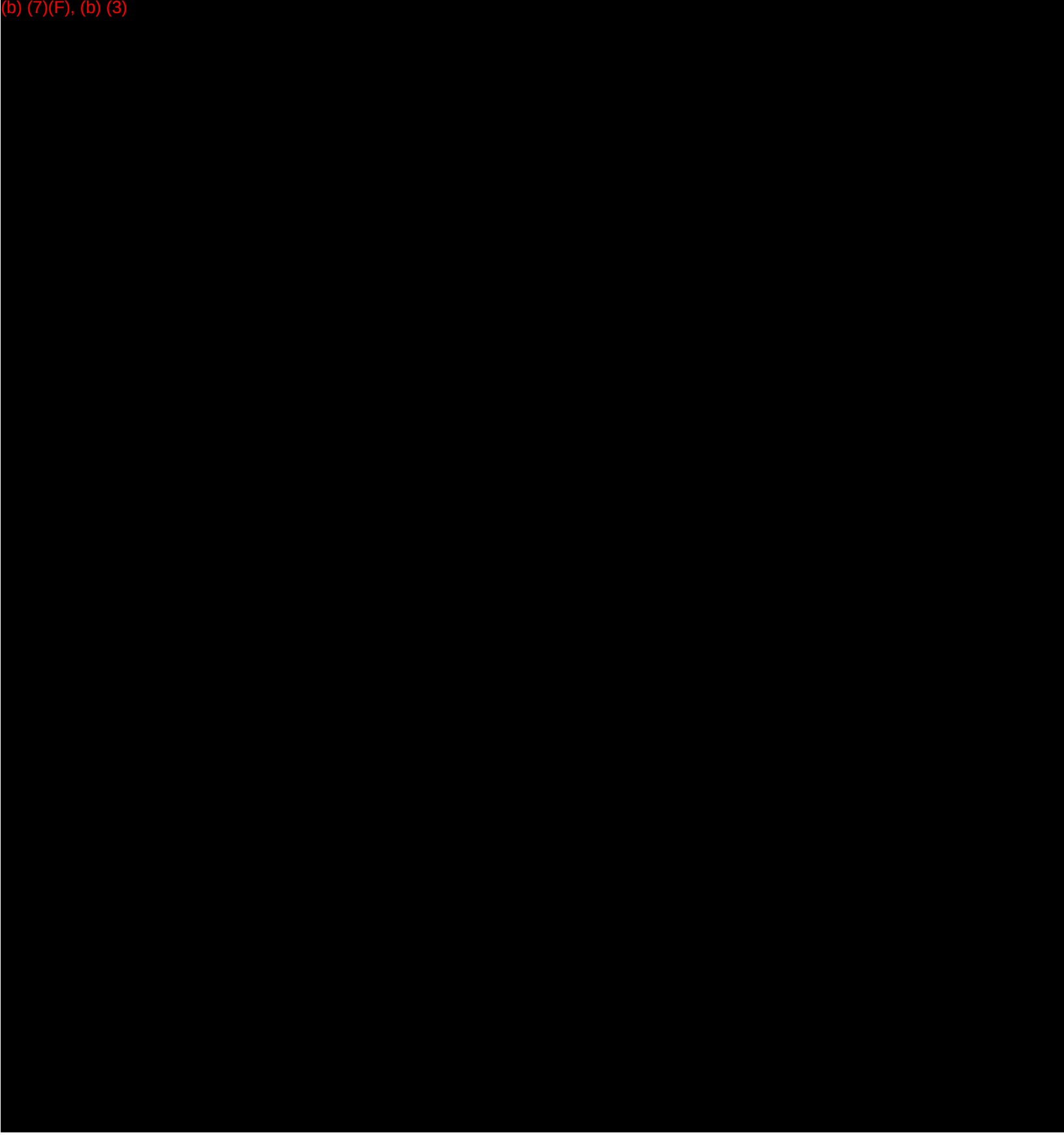


FIGURE DIET.1
DIETRICH RIVER SCENARIO MAP

(b) (7)(F), (b) (3)

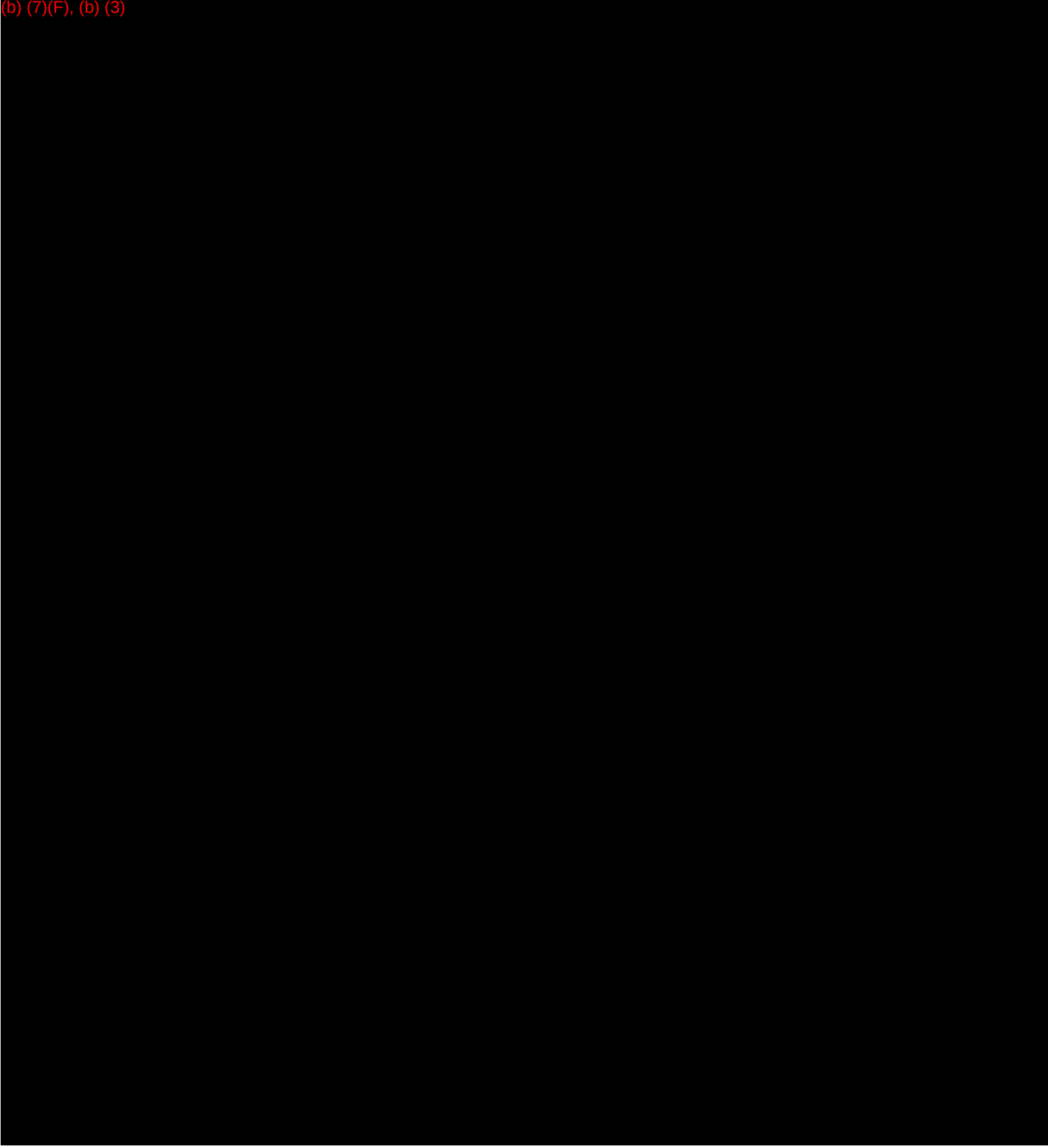


FIGURE DIET.2
DIETRICH RIVER SCENARIO DEPLOYMENT MAP

TABLE DIET.1 DIETRICH RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Situation/Status • **Weather** • **Environmental**	Winter season. Winds from the east at 10 mph. Temperature -20ºF. Approximate depth of snow cover is 18 inches.	The Dietrich River is frozen in the vicinity of the right-of-way (ROW).			
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site security: safety, site control, surveillance.	Control site access, evacuate non-essential personnel from vicinity, review initial safety assessment, and develop a site safety plan. Conduct site safety analysis (ICS Form 201-5) to identify the potential hazards, personal protective equipment (PPE) requirements, and establish a decontamination program. Take all necessary precautions to minimize the risk of fire. Monitor lower explosion limit (LEL) on site regularly and implement additional fire and safety precautions if LEL exceeds 20 percent.			
	Minimize the outflow of oil from the pipeline.	Initiate shut-in of pipeline. Close RGV 32 and open RGVs from 33 to PS05 to allow pipeline to drain downstream.			
	Restrict the spread of oil.	Determine the location of the surfacing oil and excavate an interception trench immediately upstream. Recover fluids flowing into the interception trench by pumping directly into vac trucks and transfer to containment pond #1 until a containment pond is constructed on site (containment pond #2).			
	Implement recovery operations.	Pump water from the interception trench into containment pond #2. Recover oil from the interception trench and containment ponds #2 and #3 using skimmers. Control recovered water gathering in the interception trench and containment pond by using submersible pumps.			
	Protect sensitive areas and wildlife.	Protect the Dietrich River, which has critical overwintering habitat for Arctic grayling, Dolly Varden, and round whitefish. Ensure protection of raptor nest concentrations that occur between PLMP 176 and 183.			
	Agency and stakeholder notification.	Operations Control Center (OCC) notifies the following State and Federal Agencies: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	Safety: Safety Officer from Galbraith Maintenance Base arrives on site at 1300 with air monitoring equipment and conducts a site safety analysis utilizing the "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, PPE requirements, and the establishment of decontamination. The information is radioed to the Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site. Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The LEL is monitored on a regular basis at the recovery sites. If LEL exceeds 20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck, wheeled 150-lb extinguishers, and hand held extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. If necessary, defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires using high volume handlines. The primary mission of firefighters is personnel safety and protection. A 2-person fire crew is mobilized from the North Slope (Mutual Aid) by road. They drive to Galbraith Maintenance Base and then mobilize the Galbraith Maintenance Base fire truck. Security arrives at 1300 and sets up site control.	The fire truck from Ga braith Maintenance Base and the fire fighting crew from the North Slope (Mutual Aid) arrive at the site at T + 5 hours.			
Discharge Tracking	Crude oil observed in aufeis at PLMP 181.2 by a P&CM. The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by air via helicopter, on the ground by containment and recovery operations personnel, or by both methods. The initial response tracking reports are made to the incident commander via radio at least hourly. As the containment and recovery operations become established and the risk of spread becomes reduced, reports are provided less frequently.		A mixture of oil and water enters the interception trench and is pumped directly into vac trucks.	Oil and water are being recovered from the interception trench and from the excavation of the leak source.	
Protection of Environmentally Sensitive Areas (ESAs)	The Dietrich River has critical overwintering habitat for Arctic grayling, Dolly Varden and round whitefish. Nearby highlands have raptor nest concentrations between PLMP 176 and 183.				

TABLE DIET.1 (CONTINUED) DIETRICH RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Response Actions	Crude oil observed in aufeis at (b) (7)(F), by a P&CM while conducting surveillance using the Galbraith Maintenance Base/PS04 helicopter. The P&CM contacts the PS04 Control Room Operator (CRO), who then notifies OCC and requests a shutdown of the pipeline. The Fairbanks Duty Officer is notified by OCC and in turn notifies the Fairbanks Senior Vice President. The pipeline is shut in; RGV 32 is closed and the downstream section of the pipeline is allowed to drain forward into Tank 150 at PS05. The P&CM, who assumes the position of Operations Section Chief, completes an Initial Assessment of the spill and radios it to the Galbraith Maintenance Base MS. The MS assumes the position of Initial Incident Commander. As soon as is practicable, the MS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.	Federal and state agencies are notified (ADEC, NRC, BLM, and ADNR) by OCC.			
Construction of Containment Soil Storage Stockpile and Containment Pond #1 **Task Force 1**	A crew of 4 responders and equipment from Galbraith Maintenance Base mobilize for departure to (b) (7) with equipment and materials shown in Table DIET.3.		**Contaminated Soils Containment Site #1** The responders from Ga braith Maintenance Base arrive (b) (7)(F), T + 3 hours and begin constructing the contaminated soils stockpile, located downstream of the where the oil is surfacing, and between the Dalton Highway and the ROW. Snow cover is removed and timbers and two liners are laid out.	Contaminated soils stockpile completed by 1700 hours. Work is begun on constructing a contaminated liquids containment pond (containment pond #1) between the Dalton Highway and the Dietrich River at approximately (b) (7).	**Contaminated Liquids Containment Pond #1** Contaminated liquids temporary containment pond #1 completed by 2000 hours. The liquids containment is constructed with snow berms and a 100-foot by 100-foot liner, providing an 80-foot by 80-foot area 6-feet deep area with a capacity of 5,700 barrels. Transition to baseline contractor night shift at 2000. **Decontamination Setup** TF-1 constructs a decontamination area after completion of the stockpile and containment pond # 1.
Excavation of Interception Trench and Leak Source **Task Force 2**	A two-man survey crew is mobilized from Galbraith Maintenance Base. Crew of 6 responders and equipment from Prospect Response Base (TF-2) mobilize for departure to (b) (7) The Galbraith Maintenance Base teamster mobilizes the tractor and trailer from Galbraith Maintenance Base to PS03, picks up the D-8, and begins mobilizing it to (b) (7) A teamster from Prudhoe Response Base mobilizes a tractor and trailer from Prudhoe Response Base to transport the 245 backhoe from PS03 to PLMP 181. ETA of the 245 backhoe is T + 6. A Ga braith Maintenance Base baseline contractor teamster mobilizes the D-8 Cat from PS03 to (b) (7)		The survey crew from PS04 arrives at T + 3 hours and begins surveying the position of the underground pipeline. TF-2 arrives at (b) (7) at T + 3 hours with equipment shown in Table DIET.4. The Galbraith Maintenance Base teamster arrives with the D-8 Cat at T + 5 hr.	TF-2 uses the D-8 Cat with its ripper to clear snow, ice, and the top layer of frozen material from over the top of the buried pipeline. At 1700 hours the 245 backhoe arrives at (interception trench immediately upstream of where the oil is surfacing. Clean soils are sidecast to the west of the ROW, while contaminated soils are transferred to the contaminated soils stockpile.	Oil and water are being recovered from the interception trench and from the excavation of the leak source. Transition to baseline contractor night shift at 2000. **Interception Trench** The interception trench is finished at 2400 hours after excavating below the buried pipeline, located approximately 11 feet below grade. The total depth of the trench is approximately 15 feet below grade. Contaminated soils are transferred to the contaminated soils stockpile.

TABLE DIET.1 (CONTINUED) DIETRICH RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Excavation of Interception Trench and Leak Source **Task Force 2** **(continued)**				A second contaminated liquids containment pond (#2) is constructed immediately downstream of the interception trench by using the D-8 Cat. The containment pond is 100 by 100 by 4 feet deep with 4-foot berms: total storage capacity of containment pond #2 is 4,150 barrels of liquid.	**Source Area Excavation** Based on the latest corrosion data for the area, excavation at the suspected source of the leak begins. Once the D-8 Cat is no longer needed for work at the interception trench, overburden over the suspected leak source is removed using the D-8 Cat. After the 245 backhoe is done being used for the interception trench creation, the excavation of the source area progresses. The excavation of the leak source is finished at 0600 hours after excavating below the buried pipeline (to a depth of approximately 15 feet below grade). The clean soils from the top of the source area excavation is used to construct the third liquids containment pond (containment pond #3) on the west side of the ROW. The containment pond is 100 by 100 by 4 feet deep with 4-foot berms: total storage capacity of containment pond #3 is(b) barrels of liquid. Contaminated soils are transferred to the contaminated soils stockpile.
Recovery of Crude Oil **Task Force 3**	ACS mobilizes 8 responders and TDS 136 and 118 skimmers from Prudhoe Bay for shipment to(b) (7) . A tractor and trailer from the North Slope is mobilized to PS03 to transport the submersible pump and generators. Baseline contractor responders from Galbraith Maintenance Base and Prospect Response Base (TF-1 and TF-2) mobilize two vac trucks to(b) (7) as part of their initial transit to the spill site for use by TF-3.	A crew of 2 responders and equipment shown in Table DIET.5 mobilize from Galbraith Maintenance Base (TF-3). Vac truck mobilized from Galbraith Maintenance Base arrives at(b) (7) at T+3 hours.	Two Ga braith Maintenance Base responders (TF-3) arrive on site. Vac truck mobilized from Prospect Response Base arrives(b) (7)(F), at T+5 hours.	Oil and water entering the interception trench are pumped directly into vac trucks. The vac trucks transport the recovered liquids to the temporary contaminated liquids containment pond #1. Eight ACS responders arrive on site with skimmers from Prudhoe Bay.	**Interception Trench** Once the oil/water liquid emulsion begins to accumulate in the interception trench, the 4-inch trash pump is used to recover liquids directly into the two vac trucks. The liquids are taken to the temporary liquids containment pond #1 at(b) (7) until a containment pond is built on site. 10-person baseline contractor night shift arrives and takes over recovery operations. Containment pond #2 is constructed immediately downstream of the interception trench using a D-8 Cat. The dimensions of this containment pond are 100 by 100 by 4 feet, with a berm height of 4 feet. The storage capacity of containment pond #2 is(b) (7)(F), . After containment pond #2 it is transferred to containment pond #2 by a 10-inch submersible pump. A TDS 118 skimmer is used to remove oil present on the top of the containment pond into the vac trucks, while water is decanted from the bottom of containment pond #2 by a 6-inch submersible pump. As a vac truck is filled up with oil, it transits back to contaminated liquids containment pond #1. A TDS 136 skimmer is then used in the interception trench to recover oil directly into vac trucks. The TDS skimmer has a remotely located centrifugal pump and air-powered hydraulics, minimizing the potential for fire or explosion. The skimmer operates well in Class II-III type oils and recovers very little water. The TDS 136 skimmer has a derated capacity of 12 bph. To avoid freezing the interception trench is covered and heat is applied via a forced air heater. **Source Area Excavation** Once liquids begin to enter the source area, a 6-inch submersible pump is used to - transfer liquids into containment pond #3. A TDS 118 skimmer is used to recover oil from the top of containment pond #3 into a vac truck, which in turn transports oil to the contaminated liquids containment pond #1. Water that accumulates in containment pond #3 is decanted off the bottom as needed using a 10-inch submersible pump.
Construct Dewatering Pits **Task Force 4**	A Fairbanks Response Base teamster mobilizes the 235 backhoe with an operator from Fairbanks Response Base.	Three 300 bbl vac trucks are mobilized from Mutual Aid (North Slope Operators).		Three 300 bbl vac trucks arrive on-site at T + 6 hours.	The 235 backhoe and operator arrive on-site at T + 8 hours. This crew is on standby in the event that water management becomes an issue and dewatering pits are needed to control infiltration of water in the excavation. Additional materials and equipment are available (as shown in Table DIET.6) and shared with other task forces.

TABLE DIET.1 (CONTINUED) DIETRICH RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (0000-0600)
Logistics	One responder from Galbraith Maintenance Base (not used in TF-1 or TF-3) provides logistics support by mobilizing equipment and materials to (b) (7) . The Galbraith Maintenance Base/PS04 helicopter is used as needed to transport material and personnel to and from (b) (7) .	Baseline contractor mobilizes a crew of 20 off-shift personnel to (b) (7) by 2000 hours. The additional personnel are to be flown from Fairbanks Response Base to Ga braith Maintenance Base, and then driven to (. Non-essential personnel are evacuated from PS04 and two additional fly camps at PS04 are opened to provide additional accommodations. Once the 100-personnel camp is operational at (b) (7)(F), (b) (3) on-site management of the spill is relocated to an office facility at the camp. The Fairbanks Initial Response Team (8 responders) is put on standby and requested to prepare equipment for pipeline repair.	Response command and control communications will take place using handheld and vehicle radios. Telephone communications can be made from the RGV enclosures.		If the groundwater proves to be unmanageable in the excavations, additional resources would be called out to construct dewatering pits upstream of the contaminated area (as detailed in Table DIET.6). Baseline contractor personnel dispatched from Fairbanks Response Base arrive at (b) (7) at 2000 to provide manpower for the night shift. The source of the leak from the pipeline is identified as corrosion and the Fairbanks Initial Response Team is mobilized to sleeve the pipeline. ETA on-site is T + 24 hours.

TABLE DIET.1 (CONTINUED) DIETRICH RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 19-31) Day 2 (0600-1800)	Night Shift (Hour 31-43) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)	Day Shift Day 5 (0600-1800)
Situation/Status • **Weather** • **Environmental**							
Objectives and Strategies[1]	**Objectives**	**Strategies**					
	Adjustment of objectives and tactics	Adjust objectives and supporting tactics as needed throughout the course of the response in accordance with feedback provided by the Incident Commander, Federal On-Scene Coordinator and State On-Scene Coordinator.					
	Repair of the pipeline	Plan and mobilize for installation of a sleeve on the pipeline.					
	Removal of contaminated soils	Plan a large scale earth removal operation, handling of contaminated water, and backfilling of excavations.					
Fire Prevention, Control, and Safety							
Protection of Environmentally Sensitive Areas (ESAs)							
Excavation of Interception Trench and Leak Source **Task Force 2**	Excavation of dewatering pits (only if necessary).	Operation of dewatering pits (only if necessary).					
Recovery of Crude Oil **Task Force 3**	Recovery of crude oil and water from interception trench and leak source excavation continued as necessary.						
Logistics	Additional equipment is brought to the [redacted] pump stations, Prudhoe Bay, ACS, Fairbanks Response Base and Valdez. Plans are implemented to bring on-line the 100-personnel camp (b) (7)(F), (b) (7)	Construction of 100-personnel camp a (b) (7)(F), (b) (3)				The 100-personnel camp is operational a (b) (7)(F), (b) (3)	
Waste Management	A large scale earth removal operation is planned for the removal and segregation of contaminated and clean soils. A large containment site (contaminated soils containment site #2) is established (b) (7)(F), (b) (3) -1) for contaminated soils stockpiling. A mobile thermal remediation unit is planned to be brought on site in the spring for remediation of the crude oil-contaminated soils. Backfill of the pipeline excavations is planned for spring. A series of insulated holding tanks are planned to be brought to the spill site for handling contaminated water. These tanks are to be staged close to the (b) (7)(F), , at approximately (b) (7)(F), (b) (3) .						

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations of resources and other organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE DIET.2 DIETRICH RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							
			People for set up[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People		Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity bbl	People for Set up	People for Opers			No.	Capacity (bbls/hr)	No.	Capacity bbl
Security	Site Control	Security	2	2								2						
Discharge Tracking	Aerial Tracking[4]	DT				1 helicopter (1)4								1 helicopter (1)4				
	Ground Tracking[5]	DT		Note5								Note 5						
Fire Protection	Fire Protection	FP											-					
Safety	Site Safety and Control[6]					-						1						
Response Actions	Construction of Temporary Containment Sites	TF1										4						
	Excavation of Interception Trench and Leak Source	TF2										6						
	Recovery of Crude Oil	TF3																
	Logistics	TF4										2						
	Waste Management	TF5																
Wildlife	Wildlife Hazing																	
On Scene Comms.	Communication Support	Comms.																
Source Control	Emergency Repair Response Team	Pipe Repair																
Personnel Total[7]			Note	2	0	1						18	0	1				
Mechanical Equipment Total					0	1							0	1				

TABLE DIET.2 (CONTINUED) DIETRICH RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 3-5 1400-1600								Hour 5-7 1600-1800							
			People for set up[1,2]	People for Ops[1,2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People		Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity bbl	People for Set up	People for Opers			No.	Capacity (bbls/hr)	No.	Capacity bbl
Security	Site Control	Security		2								2						
Discharge Tracking	Aerial Tracking[4]	DT				1 helicopter (1)[4]								1 helicopter (1)[4]				
	Ground Tracking[5]	DT		Note5								Note[5]						
Fire Protection	Fire Protection	FP				1 Ga braith Maintenance Base fire truck (2)				(b) (7)(F), (b) (3)				1 Ga braith Maintenance Base fire truck (1)				
Safety	Site Safety and Control[6]			1								1						(b) (7)(F), (b) (3)
Response Actions	Construction of Temporary Containment Sites	TF1		4	Soils Containment 966 Loader (1)				Soils Containment (1)		4	2	966 Loader (1)				Soils Containment (1)	
	Excavation of Interception Trench and Leak Source	TF2		6	Interception Trench						6	(6 shared with TF 2)	Interception Trench					
					245 Backhoe (1)								245 Backhoe					
					Containment Pond								Containment Pond					
					D-8 Cat with ripper (1)								D-8 Cat with ripper (1)					
	Recovery of Crude Oil	TF3		(6, shared with TF 2)	2 ea 100 bbl Vac Trucks (2) 3 ea 300 bbl Vac Trucks (3) 235 Backhoe (1) 2 Generators	3 ea TDS 118 TDS 136 Pumps and Hoses	3 1	(b)	Recovered Liquid Storage		(6, shared with TF 2)		2ea 100 bbl Vac Trucks (2)- 2 Generators	4" Trash Pump Vacuum truck (2) 3 ea TDS 118 TDS 136 Pumps and Hoses	3 1	(b)	Recovered Liquid Storage	
					Tent Heaters and Lights								Tent Heaters and Lights					
	Dewatering	TF4											3ea 300 bbl Vac Trucks (3)					
	Logistics			2 plus 20 person night shift								2 plus 20 person night shift						

TABLE DIET.2 (CONTINUED) DIETRICH RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 3-5 1400-1600								Hour 5-7 1600-1800							
			People for set up[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People		Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity bbl	People for Set up	People for Opers			No.	Capacity (bbls/hr)	No.	Capacity bbl
Response Actions (continued)	Waste Management																	
Wildlife	Wildlife Hazing																	
On Scene Comms.	Communication Support	Comms.																
Source Control	Fairbanks Initial Response Team	Pipe Repair																
Personnel Total[7]				35	5	3					Note[7]	35	8	3				
Mechanical Equipment Total					9	7							12	7				

TABLE DIET.2 (CONTINUED) DIETRICH RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 7-19 1800-0600								Hour 19+ 0600+							
			People for set up[1,2]	People for Ops[1,2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People		Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity bbl	People for Set up	People for Opers			No.	Capacity (bbls/hr)	No.	Capacity bbl
Security	Site Control	Security		2								2						
Discharge Tracking	Aerial Tracking[4]	DT		1		1 helicopter (1)[4]						1		1 helicopter (1)[4]				
	Ground Tracking[5]	DT		Note5								Note5						
Fire Protection	Fire Protection	FP		2		1 Ga braith Maintenance Base fire truck (2)						2		1 Ga braith Maintenance Base fire truck (2)				
Safety	Site Safety and Control[6]			1						(b) (7)(F), (b) (3)		1						(b) (7)(F), (b) (3)
Response Actions	Construction of Temporary Containment Sites	TF1		4	966 Loader (1)	Liners and Timbers			Soils Contain.			4	966 Loader (1)	Liners and Timbers				
									Liquid Contain.									
	Excavation of Interception Trench and Leak Source	TF2		6	Source Area							6	Source Area					
					245 Backhoe (1)								245 Backhoe (1)					
					Containment Pond								Containment Pond					
					D-8 Cat with ripper (1)			(b) (7)(F), (b) (3)					D-8 Cat with ripper (1)			(b) (7)(F), (b) (3)		
	Recovery of Crude Oil	TF3		4	2ea 100 bbl Vac	3 ea TDS 118	3		Recovered Liquid Storage (1)			(6, shared with TF 2)	2ea 100 bbl Vac	3 ea TDS 118	3			
					Trucks (2)	TDS 136	1						Trucks (2)	TDS 136	1			
						Pumps and Hoses								Pumps and Hoses				
	Dewatering Pits	TF4			3ea 300 bbl Vac Trucks (3) 235 Backhoe (1)								3ea 300 bbl Vac Trucks (3) 235 Backhoe (1)					
	Logistics			2 plus 20 person night shift								2 plus 20 person night shift						
	Waste Management	TF5																
Wildlife	Wildlife Hazing																	
On Scene Comms.	Communication Support	Comms.																
Source Control	Fairbanks Initial Response Team	Pipe Repair										8						
Personnel Total[7]				35	9	3						43	9	3				

TABLE DIET.2 (CONTINUED) DIETRICH RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 3-5 1400-1600								Hour 5-7 1600-1800							
			People for set up[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People		Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity bbl	People for Set up	People for Opers			No.	Capacity (bbls/hr)	No.	Capacity bbl
Mechanical Equipment Total					13	7							13	7				

[1] Number of people excludes state or federal representatives in the organization.

[2] Operation of a tactic may require fewer people than set up.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can respond to assess site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing set up of one tactic are reassigned to another task.

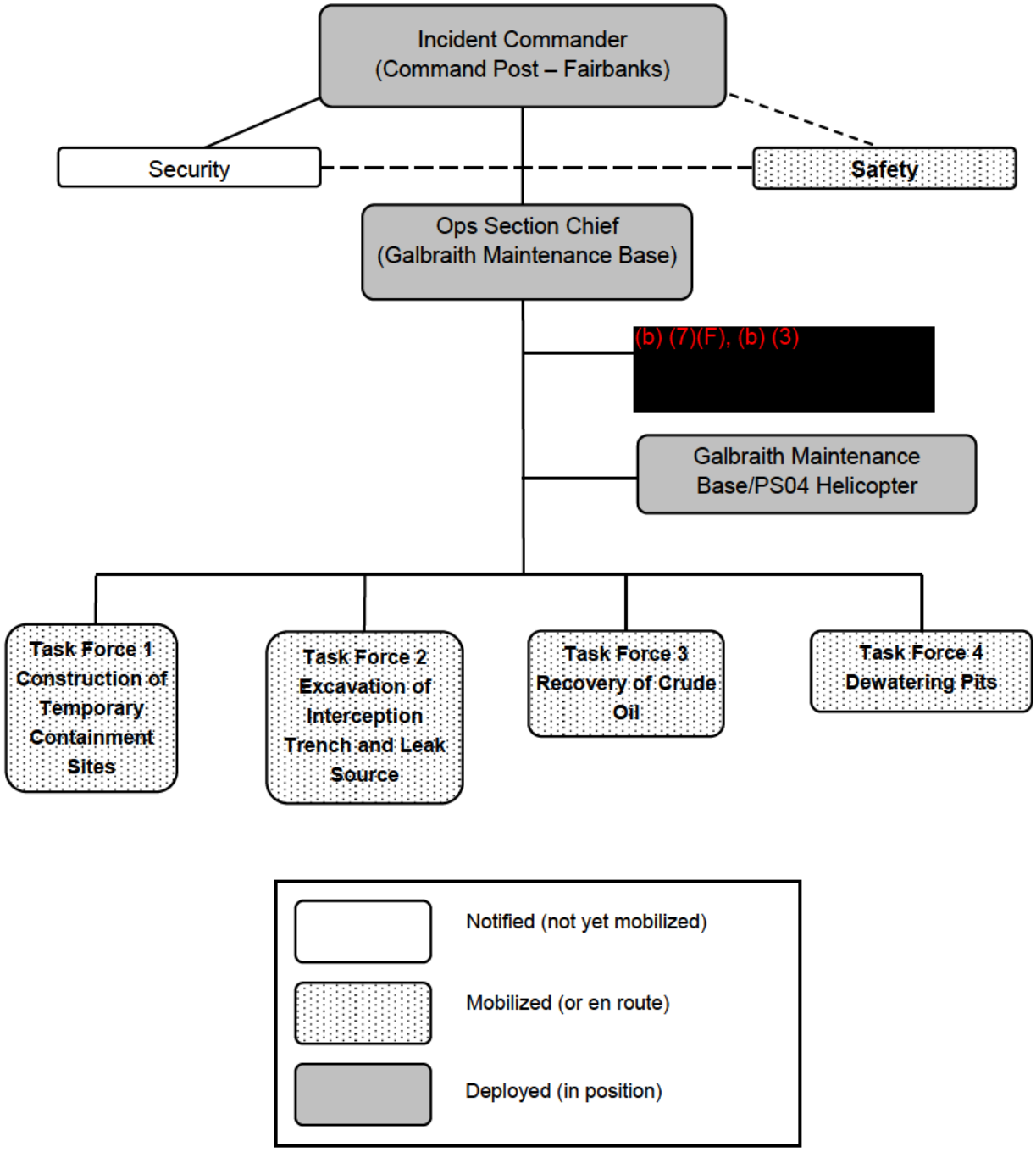


FIGURE DIET.3
DIETRICH RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

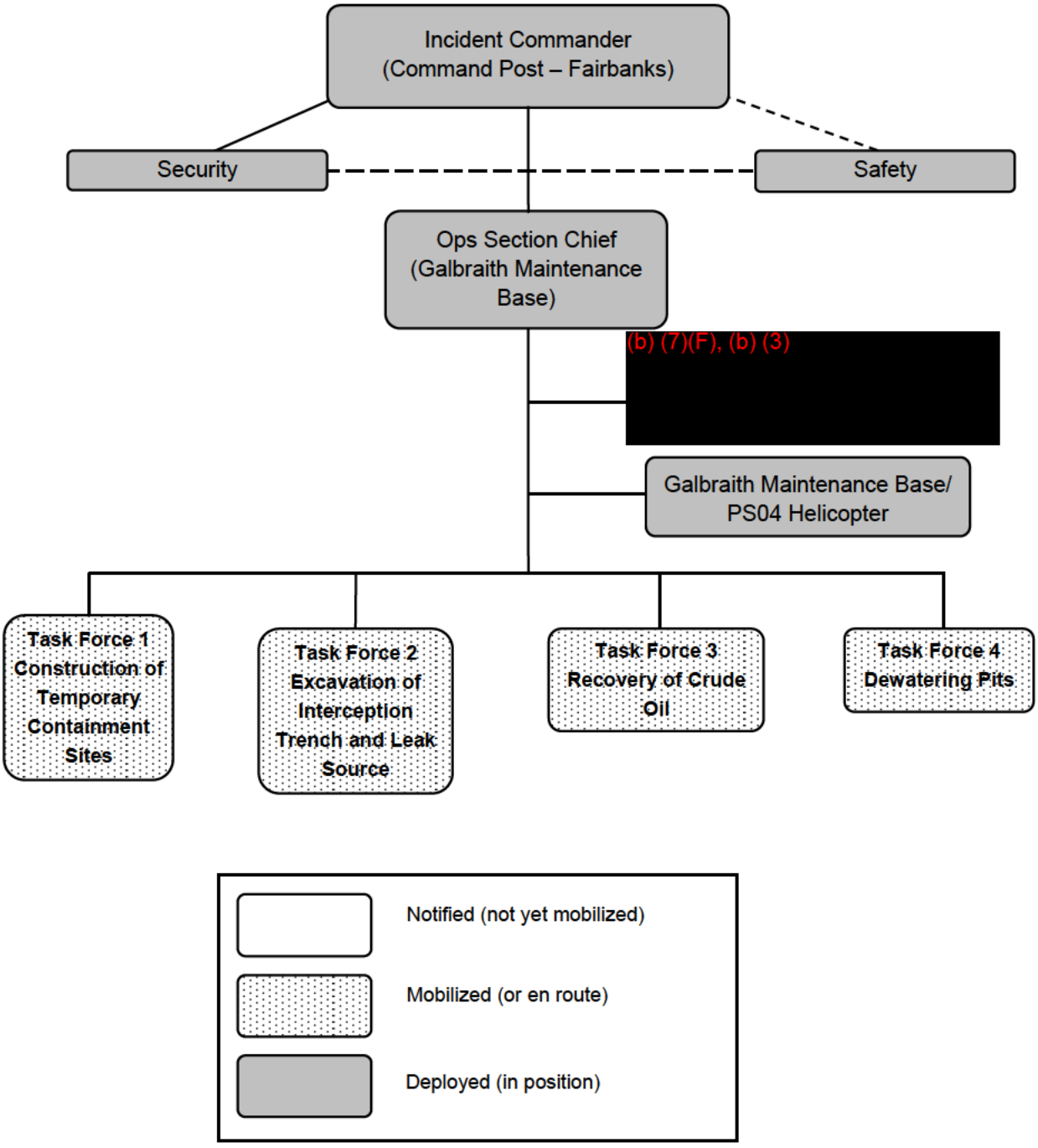


FIGURE DIET.4
DIETRICH RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

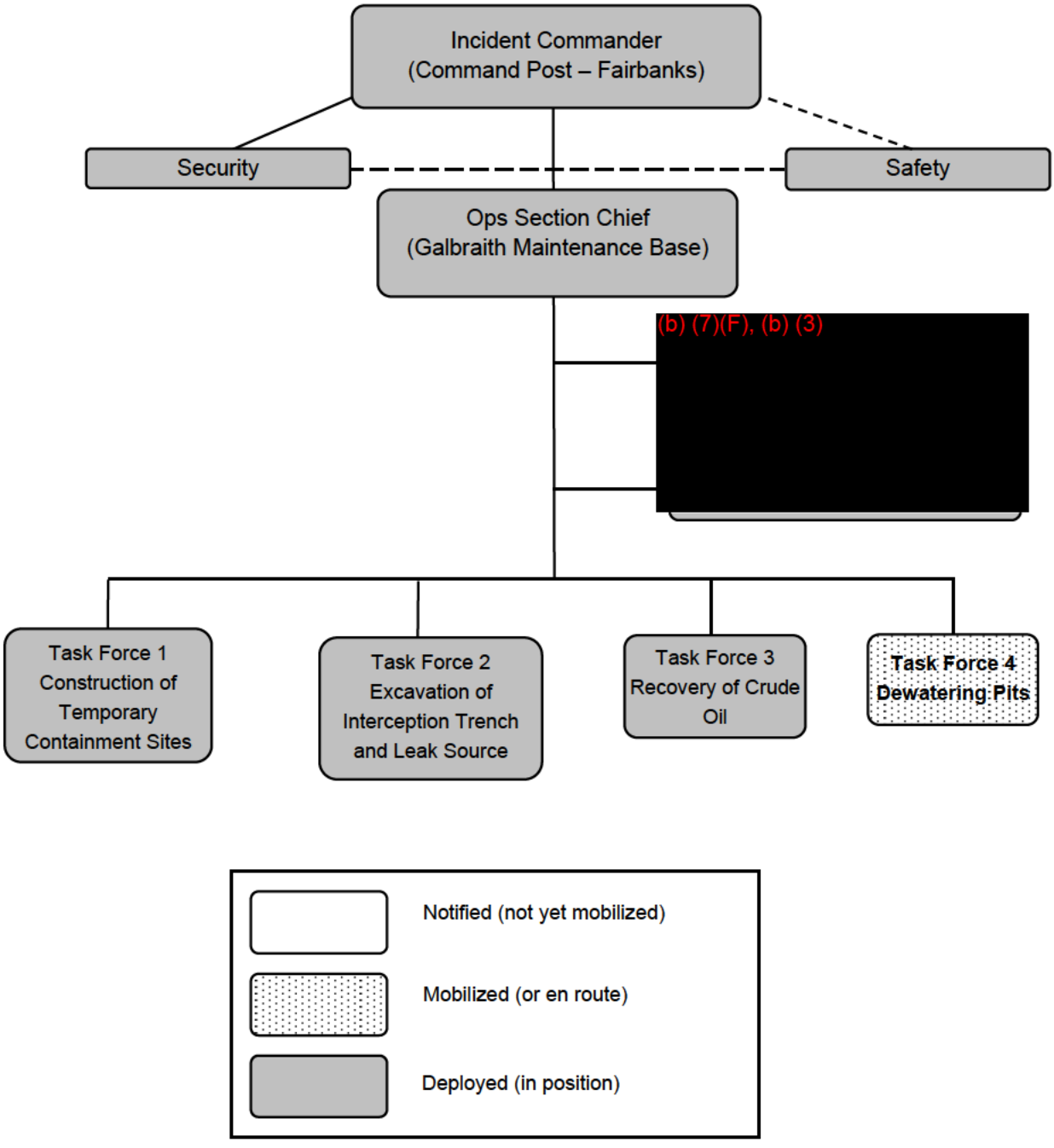


FIGURE DIET.5
DIETRICH RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-7

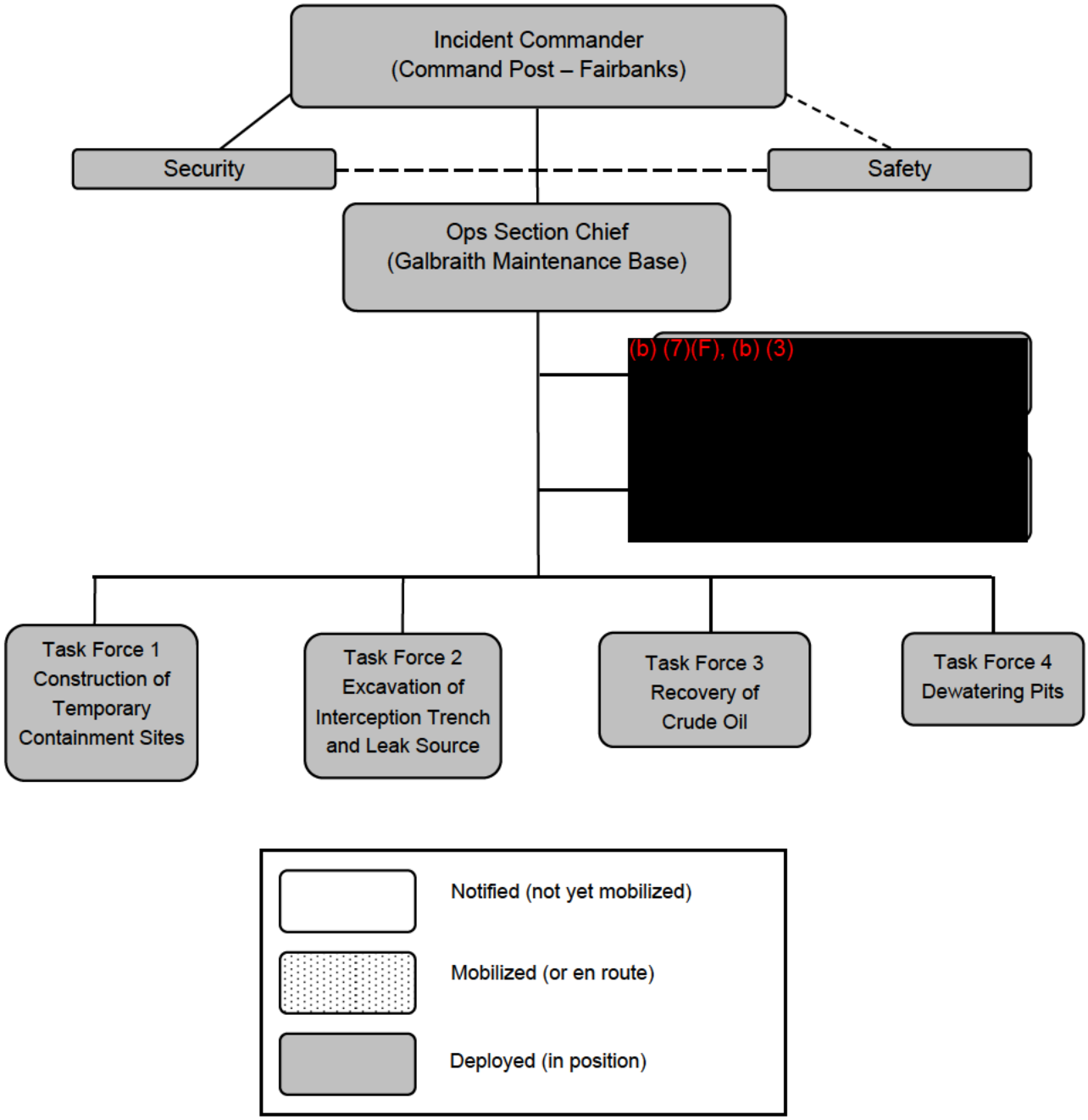


FIGURE DIET.6
DIETRICH RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 7-19+

TABLE DIET.3 DIETRICH RIVER SCENARIO
RESOURCE MOBILIZATION FOR CONSTRUCTION OF CONTAMINATED SOILS CONTAINMENT SITE #1

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
12-inch by 12-inch timbers (800 feet)	Ga braith Maintenance Base	Provide containment	T + 3 hr
100-ft by 100-ft liners (2)	Ga braith Maintenance Base	Provide impermeable lining	T + 3 hr
966 loader (operator included in crew of 4)	Ga braith Maintenance Base	Preparation of site	T + 3 hr
Ga braith Maintenance Base responders (4) (TF-1)	Ga braith Maintenance Base	Manpower for construction of site	T + 3 hr
Decon Unit	Ga braith Maintenance Base	Decontamination	T + 3 hr
Baseline contractor (4) night shift	Fairbanks Response Base	Night shift labor	T + 9 hr
Helicopter (1)	Ga braith Maintenance Base	Reconnaissance	T + 0.5-1 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from Alyeska Pipeline Service Company (APSC).

TABLE DIET.4 DIETRICH RIVER SCENARIO
RESOURCE MOBILIZATION FOR DIGGING AN INTERCEPTION TRENCH AND LIQUID CONTAINMENT PONDS #1, #2, AND #3

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
100-foot by 100-foot liners (3)	Galbraith Maintenance Base	Provide impermeable lining	T + 3 hr
D-8 Cat with ripper (operator included in crew of 6)	PS03	Removal of overburden	T + 5 hr
245 backhoe (operator included in crew of 6)	PS03	Digging interception trench	T + 6 hr
2-man survey crew	Galbraith Maintenance Base	Location of buried pipeline	T + 3 hr
Forced air heaters (2)	Galbraith Maintenance Base	Freeze protection	T + 3 hr
Light towers (2)	Galbraith Maintenance Base	Provide lighting	T + 3 hr
Tent systems (2) constructed of Visqueen and lumber	Galbraith Maintenance Base	Freeze protection	T + 3 hr
Prospect Response Base responders (6) (TF-2)	Prospect Response Base	Operate equipment	T + 3 hr
Tractor with lowboy (1)	Prudhoe Response Base	Equipment transport	T + 6 hr
Tractor with lowboy (1)	Galbraith Maintenance Base	Equipment transport	T+5 hr
Fire fighters (2)	Prudhoe Bay (Mutual Aid)	Contingency	T + 5 hr
Fire truck	Galbraith Maintenance Base	Contingency	T + 5 hr
Baseline contractor (6) night shift	Fairbanks Response Base	Night shift labor	T + 9 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE DIET.5 DIETRICH RIVER SCENARIO RESOURCE MOBILIZATION FOR RECOVERY OF OIL

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Ga braith Maintenance Base Responders (2)	Galbraith Maintenance Base	Labor	T + 3 hr
ACS responders (8)	North Slope	Labor	T + 6 hr
TDS 118 skimmers (3)	Prudhoe Bay (ACS)	Oil recovery	T + 6 hr
TDS 136 Skimmer	Prudhoe Bay (ACS)	Oil recovery	T + 6 hr
4-inch trash pumps (2)	Galbraith Maintenance Base	Dewatering	T + 3 hr
10-inch submersible pumps (2)	PS03	Dewatering	T + 7 hr
10-inch discharge hose (400 feet)	PS03	Dewatering	T + 7 hr
6-inch submers ble pumps (2)	PS03	Dewatering	T + 7 hr
6-inch discharge hose (400 inches)	PS03	Dewatering	T + 7 hr
200 kW generator set	PS03	Running submersible pump	T + 7 hr
100 kW generator set	PS03	Running submersible pump	T + 7 hr
Tractor with lowboy (1)	Prudhoe Bay Mutual Aid	Equipment transport	T + 7 hr
Vacuum trucks (2) including operators	Galbraith Maintenance Base and Prospect Response Base	Storage of recovered oil	T + 3 and 5 hr, respectively
Baseline contractor (10) night shift	Fairbanks Response Base	Night shift labor	T + 9 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE DIET.6 DIETRICH RIVER SCENARIO
RESOURCE MOBILIZATION FOR CONSTRUCTING DEWATERING PITS

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
D-8 Cat with ripper (shared with TF-2)	On-site	Removal of overburden	NA
235 backhoe with operator from Fairbanks	PS07	Digging of dewatering pits	T + 8 hr
2 man survey crew (shared with TF-2)	On-site	Location of buried pipeline	NA
300-barrel vacuum trucks (3)	Prudhoe Bay (Mutual Aid)	Storage of recovered oil	T + 6 hr
4-inch trash pump (shared with TF-3)	On-site	Dewatering	NA
Tent system (shared with TF-2)	On-site	Freeze protection	NA
Forced air heater (shared with TF-2)	On-site	Freeze protection	NA

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE DIET.7 DIETRICH RIVER SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table DIET.7. Since the release occurs at a point 11 feet below ground surface, much of the oil will be trapped in unsaturated gravel in the vicinity of the release. Some of the oil is collected from the subsurface in an interception trench and in an excavation dug adjacent to the pipeline (pipe excavation). From both of these trenches, submersible pumps are used to pump liquids (oil and water) into two 14,000 barrel lined containment ponds. The recovery rates are based on the volumes of oil pumped into the lined containment ponds using the submersible pumps. The volume of oil recovered by the TDS-136 skimmer directly from the interception trench is insignificant and has not been included in this calculation. The limiting factor to recovering oil from the trenches is the seepage rate of oil flowing into the trenches. For the purpose of estimating the recovery, it has been assumed that the oil flows into the trenches at a steady rate of 100 barrels per hour and that the submersible pumps can pump all of this oil along with any water that seeps into the trench into the lined containment ponds.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Cumulative Oil Recovered (bbl)								
			4 hr	12 hr	24 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)	[redacted]										

Scenario 5. Prospect Creek

5,000-Barrel Spill on Land to Water

This scenario depicts representative oil spill response activities for an oil spill from the failure of a ball valve during a preventative maintenance (PM) check on check valve (CKV) 50. Oil is leaking from a 1½-inch drain line.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures PROS.1 and PROS.2)
3. Timeline matrix (Table PROS.1)
4. On-site resource tally sheet (Table PROS.2)
5. Response organization charts (Figures PROS.3 through PROS.5)
6. Resource mobilization tables (Tables PROS.3 through PROS.6)
7. Summary of oil fate and estimated recovery table (Table PROS.7)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures PROS.1 and PROS.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table PROS.1). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table PROS.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures PROS.3 through PROS.5). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables PROS.3 through PROS.6). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table PROS.7).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 5 – PROSPECT CREEK 5,000-Barrel Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	5,000 barrels (bbl)– crude oil

Source

The leak occurs in a section of aboveground pipe. Oil is leaking from CKV 50, from a 1½- inch drain line.

Environmental Conditions

Time	1400	**Wind**	8 mph, from NE
Season	Spring – April 14	**Seas**	N/A
Snow/Ice Coverage	Sky is overcast	**Temperature**	38ºF
Visibility	No precipitation	**Tide/Current**	Jim River - 5-9 feet per second (fps) Prospect Creek - 3-5 fps

Environmental Considerations – Jim River, Segment 7

The Jim River and its tributary, Prospect Creek, are anadromous fish streams and considered to be critical habitat. They are sensitive all year because of the presence of Chinook salmon. Waterfowl nesting occurs on ponds, lakes, streams, and rivers throughout this segment. Important nesting habitats are in the Jim River area. A raptor nest site is located on the lower Jim River, 7 miles west of the pipeline.

Assumptions

1. Failure of drain line ball valve during PM check.
2. Oil flowing down the west side of the right-of-way (ROW) is contained by AR 91-APL-1. East of the workpad, oil flows northeast off the workpad and into Prospect Creek.
3. The responders from Galbraith Maintenance Base, Yukon Response Base, and Fairbanks Response Base are available to assist at the start of the incident.

SCENARIO 5 – PROSPECT CREEK
5,000-Barrel Spill on Land to Water

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1.1 and 4.3.3	Culvert blocking and trash pumps will be used to contain oil along Dalton Highway. Skimmers and portable oil storage tanks will be used to recover spilled oil.	Volume 2, Table PROS.4
Volume 3, Section 4.1.1	Sandbags will be used to trap oil to prevent oil from entering Prospect Creek.	Volume 2, Table PROS.5
Volume 3, Section 4.1.1 and 4.3.3	Use diversionary boom and exclusion boom to contain oil on Prospect Creek, and use skimmers, vacuum truck and portable open top tanks to recover oil on Prospect Creek.	Volume 2, Table PROS.5
Volume 3, Section 4.7	Recover oil on shorelines of Prospect Creek and Jim River.	Volume 3, Section 4.7

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table PROS.1, Prospect Creek Scenario Timeline Matrix).

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. The Linewide PM crew (4) evacuates the site.

2. The pipeline is shut in. BL-2 at PS05 and RGV 51 are closed.

   A responder and safety officer from Prospect Response Base complete an Initial Assessment and site safety analysis of the spill, determine initial control actions, and radio the information to Prospect Response Base.

   Safety and security measures are initiated. Security sets up traffic control on the Dalton Highway, both north and south of AR 91-APL-1.

   The PRB O&M assumes the position of Initial Incident Commander (IIC) and the Prospect Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the PRB O&M transfers the Incident Commander position to a member of the Fairbanks IMT and the OC assumes the position of Deputy Operations Section Chief.

   The assistance of the Galbraith Maintenance Base, Yukon Response Base, and Fairbanks Response Base responders, as well as the P&CMs from Galbraith Maintenance Base, Yukon Response Base, and Fairbanks Response Base, are requested at the start of the incident. They arrive by vehicle as follows:

   - Yukon Response Base responders (4 plus 1 P&CM) – ETA to spill site is 1700 hours
   - Fairbanks Response Base responders (3 plus 1 P&CM) – Estimated time of arrival (ETA) to spill site is 1930 hours
   - Ga braith Maintenance Base responders (3 plus 1 P&CM) – ETA to spill site is 1700 hours

   A 15-man crew is requested from baseline contractor (response action contractor) from the Fairbanks Response Base to run a night shift. A Dehaveland Dash 8 passenger aircraft contracted from ERA Aviation flies the crew to Prospect Response Base, arriving at 2100 hours and immediately relieving crews working the spill.

SCENARIO 5 – PROSPECT CREEK
5,000-Barrel Spill on Land to Water

As crews arrive at the spill site, they are deployed to the following locations:

- A Prospect Response Base responder and fire crew respond to the location of the leak to close the lower body drain valve to stop the leak (Task Force [TF] 1).
- A 2-person crew from Prospect Response Base responds to the culvert along the Dalton Highway to trap oil between the Dalton Highway and 91-APL-1 in a 30-inch culvert (TF-2).
- A four man PM crew is dispatched to dam oil at the point of entry into Prospect Creek (TF-2).
- Three Prospect Response Base responders deploy 600 feet of boom across Prospect Creek immediately below the pipeline crossing. The boom is deployed at a steep angle to compensate for water velocities and drive oil into an oxbow lake due south of Prospect Creek and upstream of the Dalton Highway. An additional 200 feet of containment boom is deployed to corral the oil inside the lake and divert it to shore at CS5-3 (TF-3).
- A Prospect Response Base responder does an aerial reconnaissance of containment sites CS4-25 and CS4-26, using PS05 helicopter and determines that containment and recovery at either location is not possible with the flood conditions on the Jim River.

Oil Trajectory

Oil is escaping from CKV 50 and flowing down both sides of the ROW. On the west side, the oil is contained by AR 91-APL-1. East of the work pad, oil is flowing northeast off the work pad, approximately 700 feet overland and into Prospect Creek.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"* or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue.

The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

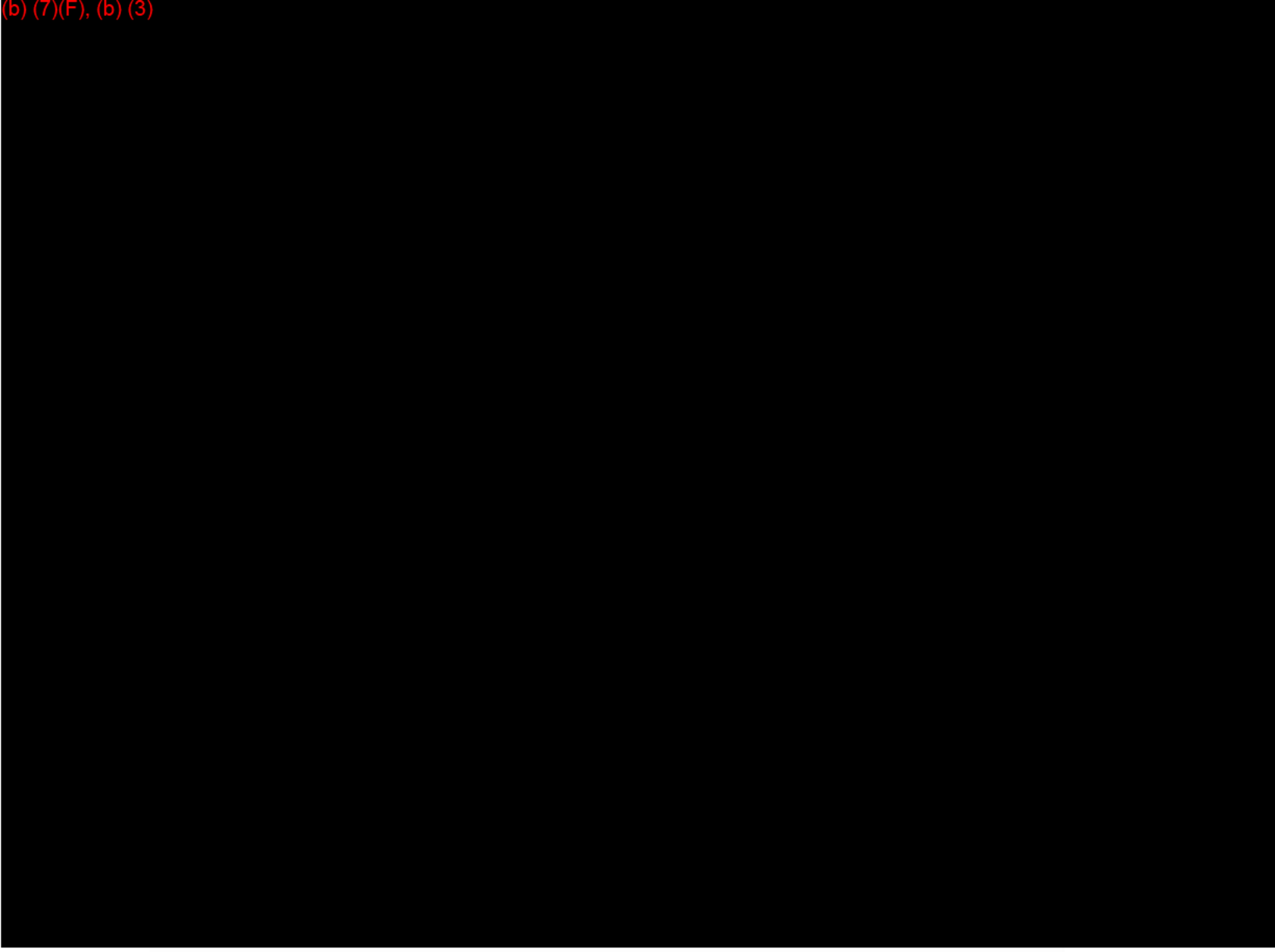


FIGURE PROS.1
PROSPECT CREEK SCENARIO MAP

(b) (7)(F), (b) (3)

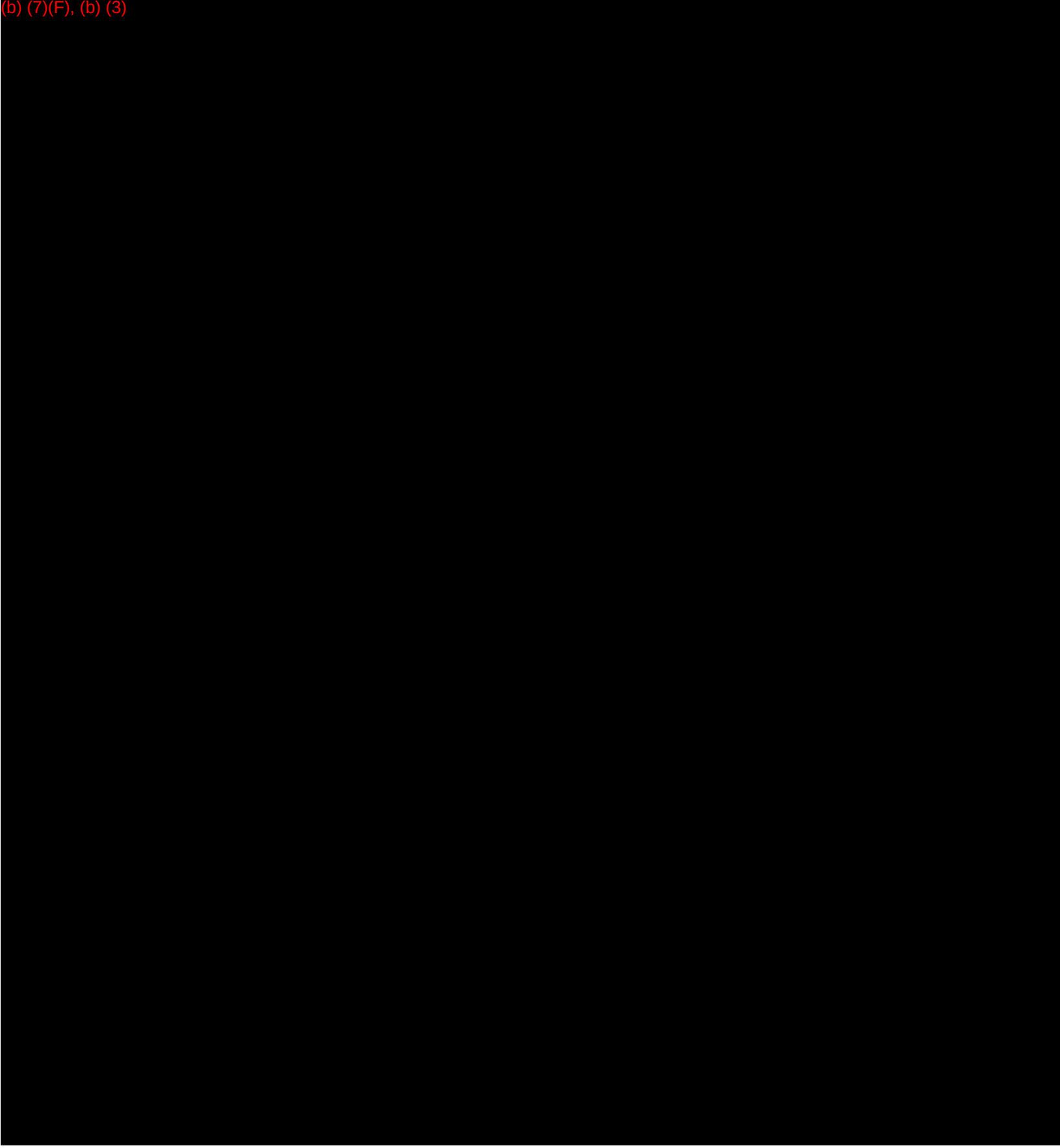


FIGURE PROS.2
PROSPECT CREEK SCENARIO DEPLOYMENT MAP

TABLE PROS.1 PROSPECT CREEK SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1400-1500) April 14	Hour 1-6 Day 1 (1500-2000) April 14	Hour 6-24 Day 1 (2000-2400); Day 2 (0000-1400) April 14 and 15
Situation/Status • **Weather** • **Environmental**	Spring season. Winds from NE at 8 mph. Temperature 38 ºF.		
Objectives and Strategies[1]	**Objectives**	**Strategies**	
	Site security: safety, site control, surveillance.	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, and develop and implement leading edge tracking.	
	Cleanup and countermeasures on land.	Close lower body drain valve to stop leak of oil. Contain on land if possible; use settlement ponds. Prepare to shut in pipeline; redirect oil flow away from facilities.	
	Cleanup and countermeasures on water.	Deploy task forces (TF); mobilize resources to maximize containment and recovery. Contain as near to pipeline as possible. Initiate free oil recovery beyond primary containment areas (Prospect Creek, Jim River). Track oil movements.	
	Protection of sensitive resources and wildlife.	Protect anadromous fish and grayling streams. Initiate ESA identification and prioritization process. The Jim River and Prospect Creek are important anadromous fish streams.	
	Agency and stakeholder notification.	The following State and Federal agencies are notified by Operations Control Center (OCC): Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.	
Fire Prevention, Control, and Safety	Safety: Safety Officer is on station at Prospect Response Base and accompanies a Prospect Response Base responder to the site. The Safety Officer brings air monitoring equipment conducts a site safety analysis utilizing the "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. The information is radioed to the Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site. In addition, safety objectives for other areas of the response, such as air operations, ground transportation, and boat handling on the Jim River, are also addressed.		
	Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If the LEL exceeds 20%, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck, wheeled 150-lb extinguishers, and hand-held extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires using high volume handlines. The primary mission of firefighters is personnel safety and protection. The ARFF fire truck from Prospect Response Base is mobilized to the site, complete with a two-man firefighting crew. A 150-pound wheeled extinguisher is positioned at the containment and recovery operation at the old material site on AR 91-APL-1. Security sets up traffic control on the Dalton Highway, both north and south of AR 91-APL-1.		

TABLE PROS.1 (CONTINUED) PROSPECT CREEK SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1400-1500) April 14	Hour 1-6 Day 1 (1500-2000) April 14	Hour 6-24 Day 1 (2000-2400); Day 2 (0000-1400) April 14 and 15
Discharge Tracking	The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by air, on the ground, or both. Aerial tracking is provided for the initial spill assessment, and tracking reports are made to the Incident Command Center via radio. On-ground observations are made by containment and recovery task force personnel who establish the extent of spread of the spilled oil. Visual monitoring of leading edge of oil along flowing water is done by aerial observation from helicopter or fixed-wing aircraft. Incident Commander tracks discharge on a situation status map.	The frequency of oil trajectory observations is almost continuous during the initial hours of the response. Tracking reports are made to the Incident Command Center via radio on an hourly basis at least. As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently. A Prospect Response Base responder does an aerial reconnaissance of containment sites CS4-25 and CS4-26 using the Prospect Response Base/PS05 helicopter and determines that containment and recovery at either location is not possible with the flood conditions on the Jim River. Approximately 500 barrels of oil escape the containment established on Prospect Creek via entrainment under the containment boom. The entrainment is nearly continuous during the initial phases of the recovery operation and reduces to zero as the oil layer in the contained area is reduced by skimming operations. This results in patches of oil sheen on the surface of Prospect Creek and the Jim River. Sheen patches on the surface of Prospect Creek are bright rainbow-colored and become silver-colored sheens on the surface of the Jim River approximately 5 miles downstream of where Prospect Creek enters the Jim River. From this point on the Jim River to a point 20 miles downriver, the sheen patches change in appearance and number to become small dull gray patches of sheen. Sheen patches are no longer visible at a point 25 miles downstream of the point where Prospect Creek enters the Jim River. This observation of the degradation of sheen patch appearance indicates that the thin layer of oil is partially evaporating, partially stranding along the riverbank, and partially becoming dissolved in the water column.	The Mobile Command Post and "Go Team" members arrive to provide support services.
Protection of Environmentally Sensitive Areas (ESAs)	Protect anadromous fish, waterfowl, and nesting habitats. Initiate ESA identification and prioritization process. Jim River and its tributary, Prospect Creek are considered critical habitat. Incident Commander identifies the priority objective as containment of oil before it reaches the Jim River.		
Response Actions	The valve PM crew notifies the PS05 Control Room Operator of leak. OCC contacts the Fairbanks Duty Officer. The Duty Officer notifies the Fairbanks Senior Vice President and the Pipeline Asset Manager. A Prospect Response Base responder and the Safety Officer who is on station at PS05 complete an initial assessment of the spill by helicopter and radios the information to the Prospect Response Base RBS. The Yukon Response Base P&CM assumes the position of Initial Incident Commander and the Prospect Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the Yukon Response Base P&CM transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. The Incident Commander issues the following incident objectives: • Protect life safety. • Keep oil on land. • Restrict the oil spread on water. • Secure the source of oil. • Implement recovery operations. • Protect sensitive areas and wildlife.	OCC notifies Federal and State agencies (ADEC, NRC, BLM, and ADNR). 1700 hours – Galbraith Maintenance Base responders (3 + 1 P&CM) arrive by vehicle at spill site. 1700 hours – Yukon Response Base responders (3 + P&CM) arrive by vehicle at spill site. 1930 hours – Fairbanks Response Base responders (3 + 1 P&CM) arrive by vehicle at spill site. These crews bring the vac trucks from Galbraith Maintenance Base, Yukon Response Base, and Fairbanks Response Base with them to assist in transportation of recovered oil. In addition, the crew from Fairbanks brings their Komara 12 K Skimmer which is used to recover oil at the Dalton Highway. The 12 K minimizes the amount of free water collected and maximizes storage capacity. Response command and control communications are conducted over hand-held and vehicle radios. The areas of response operations are in close proximity to PS05 and in line of site. Portable radio repeater sets may be needed if response operations are conducted below CS4-26. A Communication Plan is developed and issued as part of the Incident Action Plan(s).	2100 hours – 15-man crew from baseline contractor arrives by passenger aircraft (ERA Aviation) at Prospect Response Base for night shift. The crew immediately relieves crews working the spill. Response personnel are housed at Prospect Response Base using the PLQ and the mobile camp quarters. Additional room units can be moved from PS03 within 72 hours if needed.
Task Force 1 **Source Control and Valve Closure**	A Prospect Response Base responder and fire crew from the Prospect Response Base (TF-1) respond to the location of the leak to close the valve and stop the leak.	Decontamination facilities are established on site. The fire truck lays a blanket of foam on the valve to minimize the potential for fire and/or explosion. A technician wearing appropriate personal protective equipment climbs CKV 50 and closes the valve. This operation is completed two hours after initial notification. TF-1 actions complete.	

TABLE PROS.1 (CONTINUED) PROSPECT CREEK SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1400-1500) April 14	Hour 1-6 Day 1 (1500-2000) April 14	Hour 6-24 Day 1 (2000-2400); Day 2 (0000-1400) April 14 and 15
Task Force 2 **Block Culvert and Dam Oil**	Two Prospect Response Base responders (TF-2) are mobilized to block a 30-inch culvert on the Dalton Highway 700 feet south of 91-APL-1 to trap oil between the Dalton Highway and 91-APL-1. The 4-man valve linewide PM crew (TF-2) is mobilized to dam oil at the point of entry into Prospect Creek. Both crews arrive on-site at T + 1 hour.	The crew from Prospect Response Base blocks the culvert by 1600 hours. No oil has gone through the culvert. Approximately 3,500 barrels of oil are trapped in this area. If necessary, once the culvert has been blocked, a 4-inch trash pump is set up as a precautionary measure to pump clean water across the Dalton Highway and stop the dammed oil/water from overtopping the road. Oil recovery operations are commenced utilizing a Komara 12 K Skimmer with a derated recovery capacity of 22.6 gallons per minute (gpm) or 768 barrels per day (bpd. Recovered oil is pumped into 5,000 gallons of open top storage. The PM crew use sandbags and 50-foot sections of boom to trap as much oil as possible and keep it from going into the river. Approximately 6,000 gallons of open top storage is positioned in close vicinity to the trapped oil and the Fairbanks Response Base Komara 12 K Skimmer is used to recover the oil.	The Fairbanks Response Base baseline contractor night shift arrives at 2100 and takes over containment and recovery operations.
Task Force 3 **Containment and Recovery at Prospect Creek**	Three Prospect Response Base responders (TF-3) arrive with 800 feet of boom at T + 30 minutes. They begin placing boom on arrival.	TF-3 deploys 600 feet of boom across Prospect Creek immediately below the pipeline crossing. The boom is deployed at a steep angle to compensate for water velocities and drives oil into an oxbow lake due south of Prospect Creek and upstream of the Dalton Highway. Initial placement of boom across Prospect Creek is completed by 1530 hours. An additional 200 feet of containment boom is deployed to corral the oil inside the lake and divert it to shore at CS5-3. By 1630 hours, oil is being recovered utilizing a Manta Ray skimmer. Derated recovery rate is 24 gpm or 822 bpd. Recovered oil is temporarily held in 5,000 gallons of open top storage. In total, approximately 800 barrels of oil are diverted into the oxbow lake and recovered.	The Fairbanks Response Base baseline contractor night shift arrives at 2100 and takes over containment and recovery operations. As the open top tanks fill up they are off-loaded by the vac truck, which hauls the oil to PS05 for reinjection.
Wildlife Protection – Rehabilitation	The Wildlife Protection and Rehabilitation Plan is activated (also see Protection of ESAs above). Environment Unit contacts CCI to provide 10 wildlife hazers from Fairbanks and requests them to mobilize the Fairbanks wildlife treatment center. CCI wildlife hazers begin mobilizing from Fairbanks to the spill site. IBRRC (Berkeley, CA) are notified and requested to establish wildlife hazing, treatment, and stabilization facilities. Treatment center in Anchorage is put on standby.		CCI hazers arrive on-site at T + 10 hours with the wildlife treatment center. The IBRRC arrives on location within 24 hours and takes over coordination of overall wildlife response operation, including bird hazing, capture, and stabilization.
Waste Disposal		Solid waste will be segregated into three categories and placed in clear bags: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area in an old material site as close to Pump Station 5 as is practical. This soil will be thermally remediated on site.	Waste management efforts continue as waste is generated.
Shoreline Cleanup Plan			Five Vikoma shore vacs are brought in from Valdez SERVS to assist in the recovery of oil adhering to gravel and tundra surfaces.

TABLE PROS.1 (CONTINUED) PROSPECT CREEK SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Hour 24 + Day 2 (1400) + April 15 +
Waste Disposal	Waste management efforts continue as waste is generated during the shoreline cleanup work.
Shoreline Cleanup Plan	During the days that follow, cleanup activities focus on the oil remaining along the shorelines of Prospect Creek and the Jim River. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. Oiled gravel on the workpad is stored in a temporary lined area for later cleaning or incineration and reuse. The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel mixed with peat, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge and recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are used to recover deeper pools of oil when poss ble. Oiled peat slurries may be removed by small loaders and transported to stable areas for cleaning. Peat outcrops will be raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about 2 weeks, the shoreline cleanup crews recover about one-half of the oil volume estimated to remain onshore following completion of initial recovery efforts. The initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE PROS.2 PROSPECT CREEK SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1400-1500								Hour 1-6 1500-2000						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1	1	--	1 Prospect Response Base /PS05 helicopter (1)[4]	--	--	--	--	1	--	1 Prospect/PS05 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	--	Note 5	--	--	--	--	--	--	Note 5	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	150- b wheeled extinguisher Prospect Response Base ARFF Fire Truck (2)	--	--	--	--	2	--	150-lb wheeled extinguisher 1 Prospect Response Base ARFF Fire Truck (2)	--	--	--	--
Safety	Site Safety and Control[6]	--	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Source Control	Close Valve and Stop Leak	TF-1	1	1 Prospect Response Base responder closes the valve	--	1 ambulance (2) Decontamination Equipment	--	--	--	--	1	--	1 ambulance (2) Decontamination Equipment	--	--	--	--
Containment and Recovery	Block Culvert and Dam Oil	TF-2	6	Prospect Response Base responders (2) Linewide PM Crew (4)	--	--	--	--	--	--	6	Prospect Response Base vac truck (1) 8	Sandbags 50-ft sections of boom (1,000 feet total) 2 Komara 12K skimmers 4-inch trash pump culvert blocking materials open top storage	2	64 total	varies	262 total
	Containment and Recovery at Prospect Creek	TF-3	3	Prospect Response Base responders (3)	--	800 ft of boom 150-pound fire extinguisher	--	--	--	--	Prospect Response Base crew (3) Galbraith Maintenance Base crew (3) Yukon Response Base crew (3) Fairbanks Response Base crew (3) 3 P&CMs Total of 15	Galbraith Maintenance Base vac truck (1)[8] Yukon Response Base vac truck (1)[8] Fairbanks Response Base vac truck (1)[8]	800 ft of boom Manta Ray skimmer 150-pound fire extinguisher open top storage	1	34	varies	800 total
Wildlife Protection – Rehabilitation	Wildlife Protection – Rehabilitation	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Waste Disposal	Waste Disposal	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE PROS.2 (CONTINUED) PROSPECT CREEK SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1400-1500								Hour 1-6 1500-2000						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
On-Scene Comms.	Communication Support	Comms.	--	--	--	--	--	--	--	--	--	--	Handheld and vehicle radios	--	--	--	--
Personnel Total			Note[7]	13	--	5					27	4	6				
Mechanical Equipment Total					--	5						4	9				

TABLE PROS.2 (CONTINUED) PROSPECT CREEK SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 6-24 2000-1400								Hour 24+ 1400+						
			People for Setup [1,2]	People for Ops [1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers [3]		Storage [3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers [3]		Storage [3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking [4]	DT	1	1	--	1 Prospect Response Base/PS05 helicopter (1) [4]	--	--	--	--	1	--	1 Prospect Response Base/PS05 helicopter (1) [4]	--	--	--	--
	Ground Tracking [5]	DT	Note [5]	--	--	--	--	--	--	--	Note [5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	150- b wheeled extinguisher 1 Prospect Response Base ARFF fire truck (2)	--	--	--	--		--	150-lb wheeled extinguisher 1 Prospect Response Base ARFF Fire Truck (2)	--	--	--	--
Safety	Site Safety and Control [6]	--	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Source Control	Close Valve and Stop Leak	TF-1	--	--	--		--	--	--	--	--	--		--	--	--	--
Containment and Recovery	Block Culvert to Prospect Creek	TF-2	6	6	Prospect Response Base Vac Truck (1) [8]	Sandbags 50-ft sections of boom (1,000 feet total) 2 Komara 12K skimmers 4-inch trash pump culvert blocking materials open top storage	2	64 total	Varies	262 total	6	Prospect Response Base vac truck (1)	Sandbags 50-ft sections of boom (1,000 feet total) 2 Komara 12K skimmers 4-inch trash pump culvert blocking materials open top storage	2	64 total	varies	262 total
	Containment and Recovery at Prospect Creek	TF-3	30	Prospect Response Base crew (3) Galbraith Maintenance Base crew (3) Yukon Response Base crew (3) Fairbanks Response Base crew (3) 3 P&CMs 15 for night shift from Baseline Total of 30	Ga braith Maintenance Base Vac Truck (1) [8] Yukon Response Base Vac Truck (1) [8] Fairbanks Response Base Vac Truck (1) [8]	800 ft of boom 150-pound fire extinguisher Manta Ray Skimmer open top storage Dash 8 Aircraft (1)	1	34	Varies	800 total	Prospect Response Base crew (3) Galbraith Maintenance Base crew (3) Yukon Response Base crew (3) Fairbanks Response Base crew (3) 3 P&CMs 15 for night shift from baseline contractor Total of 30	Galbraith Maintenance Base vac truck (1) [8] Yukon Response Base vac truck (1) [8] Fairbanks Response Base vac truck (1) [8]	800 ft of boom Manta Ray Skimmer 150-pound fire extinguisher 5 Vikoma Shore vacs open top storage Dash 8 Aircraft (1)	1 5	34 50 total	varies	800 total ▪
Wildlife Response	Wildlife Protection – Rehabilitation	--	10	10 CCI 10 IBRRC	--	Wildlife Treatment Center	--	--	--	--	10 CCI 10 IBRRC	--	Wildlife Treatment Center	--	--	--	--

TABLE PROS.2 (CONTINUED) PROSPECT CREEK SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 6-24 2000-1400								Hour 24+ 1400+						
			People for Setup [1,2]	People for Ops [1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Waste Disposal	Waste Disposal	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	Mobile Command Post (12)	Handheld and vehicle radios	--	--	--	--	--	Mobile Command Post	Handheld and vehicle radios	--	--	--	--
Personnel Total			--	59	16	3					59	16	3				
Mechanical Equipment Total					4	7						4	12				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the “People for Ops” column.

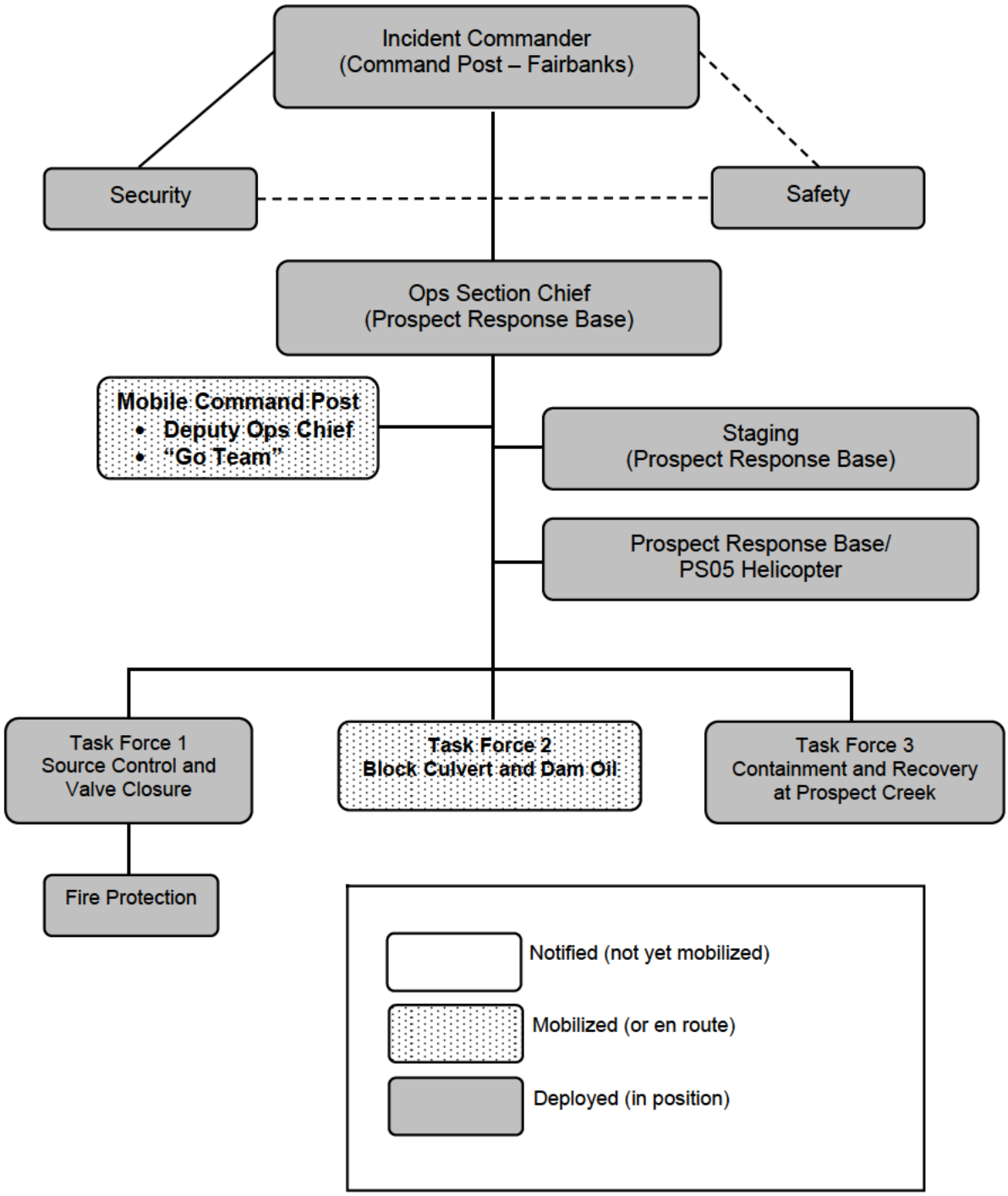


FIGURE PROS.3
PROSPECT CREEK SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

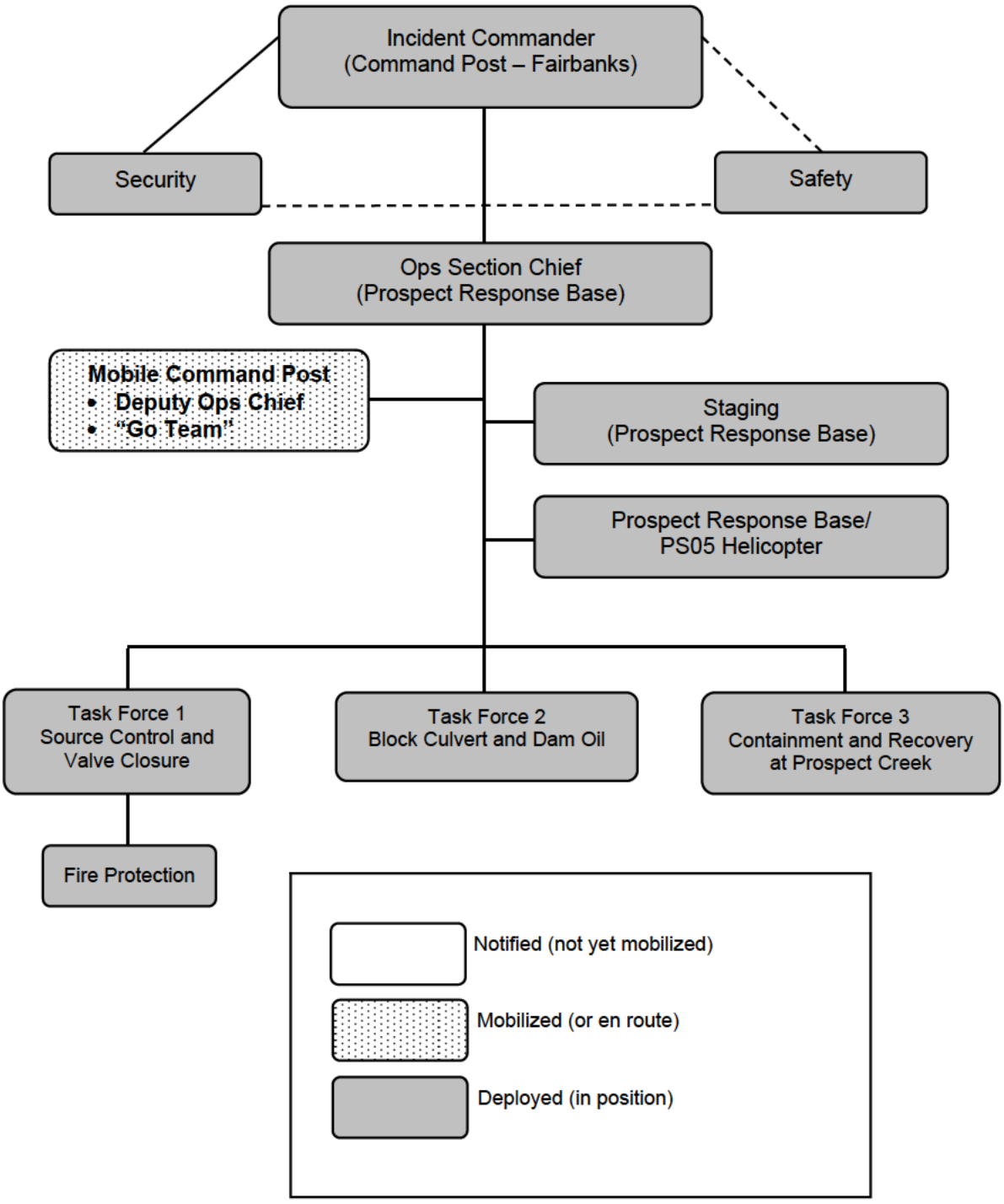


FIGURE PROS.4
PROSPECT CREEK SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

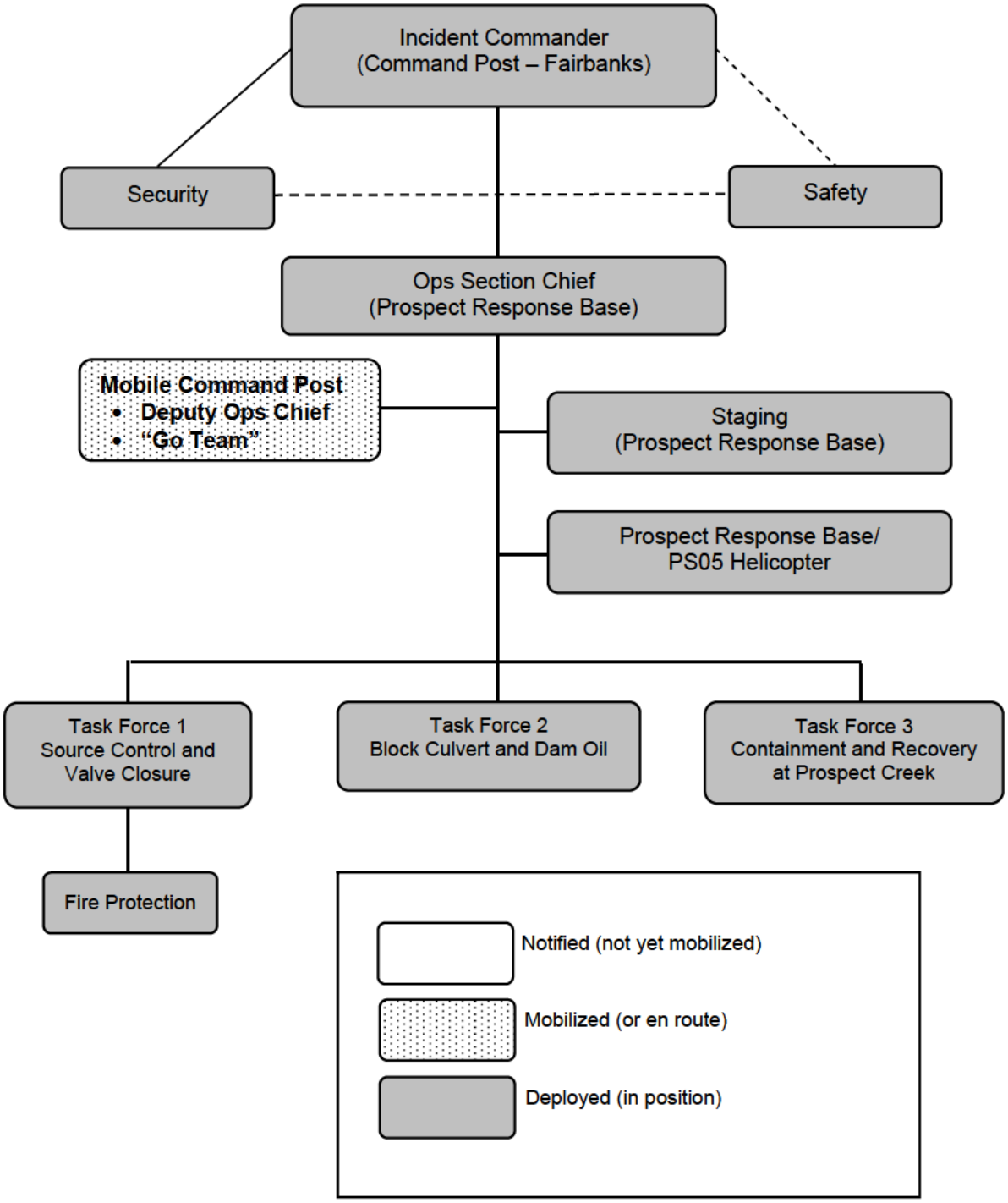


FIGURE PROS.5
PROSPECT CREEK SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-6

TABLE PROS.3 PROSPECT CREEK SCENARIO
TASK FORCE 1---RESOURCE MOBILIZATION FOR SOURCE CONTROL AND VALVE CLOSURE

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Fire truck with fire extinguishers (2) and firefighters (2)	Prospect Response Base	Foam the valve	T + 30 min
Ambulance	Prospect Response Base	Contingency	T + 30 min
Appropriate Personal Protective Equipment	Prospect Response Base	Breathing apparatus	T + 30 min
Prospect Response Base Responder – TF-1 (1)	Prospect Response Base	Close the valve	T + 30 min
Decontamination	Prospect Response Base	Decontamination of personnel exposed to crude oil	T + 30 min

TABLE PROS.4 PROSPECT CREEK SCENARIO
TASK FORCE 2---RESOURCE MOBILIZATION FOR BLOCKING CULVERT AND DAMMING OIL

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Prospect Response Base Responders – TF-2 (2)	Prospect Response Base	Block culvert	T + 1 hr
Linewide PM Crew – TF-2 (4)	Prospect Response Base	Dam oil getting into Prospect Creek	T + 1 hr
50-foot sections of boom (1000 feet total)	Prospect Response Base	Contain oil on Prospect Creek	T + 1 hr
4-inch trash pump	Prospect Response Base	Pump water to prevent from overtopping the road	T + 1 hr
Culvert blocking materials	Prospect Response Base	Block culvert at south of 91-APL-1	T + 1 hr
Komara 12K skimmer (2)	Prospect Response Base, Fairbanks Response Base	Recover oil	T + 1 hr, T + 5.5 hr
Sandbags	Prospect Response Base	Trap oil and prevent it from entering the creek	T + 1 hr
Open top storage (11,000 gallons)	Prospect Response Base	Store recovered oil	T + 1 hr

TABLE PROS.5 PROSPECT CREEK SCENARIO
TASK FORCE 3---RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY OF OIL ON PROSPECT CREEK

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Prospect Response Base Responders – TF-3 (3)	Prospect Response Base	Contain and recover oil	T + 30 min
Manta Ray skimmer	Prospect Response Base	Recover oil	T + 1 hr
Boom (800 ft)	Prospect Response Base	Contain oil on Prospect Creek	T + 30 min
150-pound fire extinguisher	Prospect Response Base	Fire prevention	T + 30 min
Open top storage (5,000 gal)	Prospect Response Base	Store recovered oil	T + 1 hr
Vac truck (4,200 gallons)	Prospect Response Base	Transport oil to PS05 for reinjection	T + 1 hr

TABLE PROS.6 PROSPECT CREEK SCENARIO
RESOURCE MOBILIZATION FOR ADDITIONAL RESOURCES FOR CONTAINMENT AND RECOVERY

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Baseline contractor night shift personnel (15 people)	Fairbanks Response Base	Night shift on Task Forces	T + 7 hr
Yukon Response Base Responders (3) and P&CM	Yukon Response Base	Additional resources for containment and recovery	T + 3 hr
Galbraith Maintenance Base Responders (3) and P&CM	Ga braith Maintenance Base	Additional resources for containment and recovery	T + 3 hr
Fairbanks Response Base responders (3) and P&CM	Fairbanks Response Base	Additional resources for containment and recovery	T + 5.5 hr
Vac trucks (3)	Ga braith Maintenance Base, Yukon Response Base, Fairbanks Response Base	Transport oil	T + 3 to 5.5 hr
Dash 8 Passenger Aircraft (1)	ERA Aviation Fairbanks	Transport night shift personnel	T+7 hr
Helicopter	Prospect Response Base/PS05	Aerial tracking	T + 30 min
Vikoma shore vacs (5)	Valdez SERVS	Recovery of oil on gravel and tundra	T + 10 hr

TABLE PROS.7 PROSPECT CREEK SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table PROS.7. Oil is retained in four locations: west of the ROW by 91-APL-1 (300 barrels), east of the ROW before entry into Prospect Creek (200 barrels), by booming and diverting in Prospect Creek (300 barrels), and at the culvert at the Dalton Highway (3,500 barrels). An additional 500 barrels escapes through the containment on Prospect Creek and travels into the Jim River. Emulsification rates for oil that has reached Prospect Creek are estimated and shown in Table PROS.7.

After all oil has been recovered from the sandbagged area east of the release point and retained in the Prospect Creek oxbow, the Manta Ray and Komara 12K skimmers will be relocated to the blocked culverts at the Dalton Highway to maximize recovery rates at this location.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Cumulative Oil Recovered (bbl)								
			4 hr	12 hr	24 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)											

Section 6. Pump Station 5 Tank Spill

10,000-Barrel Crude Oil Discharge into the Secondary Containment Area

This scenario depicts representative oil spill response activities for an oil spill on land to water from a 10,000-barrel crude oil tank.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures PS05.1 and PS05.2)
3. Timeline matrix (Table PS05.1)
4. On-site resource tally sheet (Table PS05.2)
5. Response organization charts (Figures PS05.3 through PS05.5)
6. Resource mobilization tables (Tables PS05.3 and PS05.4)
7. Summary of oil fate and estimated recovery table (Table PS05.5)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures (b) (7)(F), (b) (3) respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (b) (7)(F), (b)). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario ((b) (7)(F), (b) The fifth component is the organization structure for the scenario provided as a series of organization charts (b) (7)(F), (b) (3)). The sixth component consists of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site ((b) (7)(F), (b) (3)). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates ((b) (7)(F), (b)).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be

expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

PUMP STATION 5 TANK SPILL SCENARIO Tank Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3) f crude oil are discharged into the secondary containment area. Approximately 1,000 barrels escape through the northwest tank farm gate valve which has been partially left open. Approximately 100 barrels flow into the Jim River.

Source
Tank 150 is overfilled.

Environmental Conditions			
Time	1200 hours	**Wind**	10 mph, out of the south
Season	May 5	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	35ºF
Visibility	No precipitation	**Tide/Current**	Jim River in full flood, 8 feet per second (fps) or 5.5 mph

Environmental Considerations
The Jim River and its tr butary, Prospect Creek, are anadromous fish streams considered to be critical habitat. They are sensitive all year because of the presence of Chinook salmon. Waterfowl nesting occurs on ponds, lakes, streams, and rivers throughout this segment. Important nesting habitats are in the Jim River area. There is a raptor nest site on the lower Jim River, 7 miles west of the pipeline.

Assumptions
1. 1,000 barrels escape tank farm secondary containment.
2. Containment and recovery operation at Dalton Highway: 900 barrels recovered within 72 hours.
3. 100 barrels escape containment at Dalton Highway, flowing into Jim River.
4. Jim River at full flood, moving 8 feet per second or 5.5 mph. It is determined that it is not safe to deploy boom or vessels into the river.

PUMP STATION 5 TANK SPILL SCENARIO
Tank Spill on Land to Water

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1.1 and 4.3.3	Containment and recovery operation established on the Dalton Highway by culvert blocking, pumps and skimmers, portable oil tanks and vacuum trucks.	Volume 2, Table PS05.3
Volume 3, Section 4.1.1	A backhoe will be used to dig containment sumps and oil recovery at tank farm will be by use of pump and hose to directly reinject oil to Injection Pump Building sump.	Volume 2, Table PS05.4

Support Action Taken

1. Staff member at PS05 notices spill and reports it to the PS05 Control Room Operator
2. Control Room notifies Operations Control Center (OCC) and the Prospect Response Base RBS.
3. The RBS notifies the Fairbanks Duty Officer who in turn notifies the Pipeline Manager.
4. The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy.

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. Crude oil input into Tank 150 is secured.
2. The Yukon Response Base P&CM assumes the position of Initial Incident Commander and the Prospect Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the Yukon Response Base P&CM transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.
3. If it is safe to do so, Tank 150 is de-inventoried. Oil is injected into the mainline.
4. Two Prospect Response Base responders conduct responder work in the Tank Farm. One, wearing appropriate personal protective equipment completely closes the gate valve on the tank farm drain. The second responder operates a backhoe.
5. A site safety assessment is conducted to ascertain the immediate threat to the personnel at the pump station. The Incident Commander places the pump station on notice that an evacuation may be required.
6. The RBS, Safety Officer, and Environmental Coordinator (EC) are requested out of Galbraith Maintenance Base. The helicopter from Galbraith Maintenance Base/PS04 transports these individuals to Prospect Response Base. Estimated time of arrival (ETA) is T + 2 hours.
7. A containment and recovery operation is established on the Dalton Highway by four Prospect Response Base responders. Warning signs are placed on the Dalton to notify vehicular traffic of congestion and work activity.
8. Prospect Response Base RBS requests Galbraith Maintenance Base to send a 4-person crew to Prospect Response Base to assist with response in the Tank Farm.
9. The Prospect Response Base RBS requests a 4-person crew from Galbraith Maintenance Base and a 4-person crew from Fairbanks Response Base for the night shift.

PUMP STATION 5 TANK SPILL SCENARIO
Tank Spill on Land to Water

Oil Trajectory

Oil flows north/northwest off of the pump station pad and parallels the pipeline right-of-way (ROW) to a low water crossing (LWC) just north of BL1. The oil flows under the ROW to two corrugated metal pipes (CMP) (24-inch and 30-inch) that go under the Dalton Highway. Approximately 100 barrels get past the Dalton Highway before the culverts are blocked. The oil escaping containment flows into the Jim River.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment,"* or other tactics determined by Operations to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

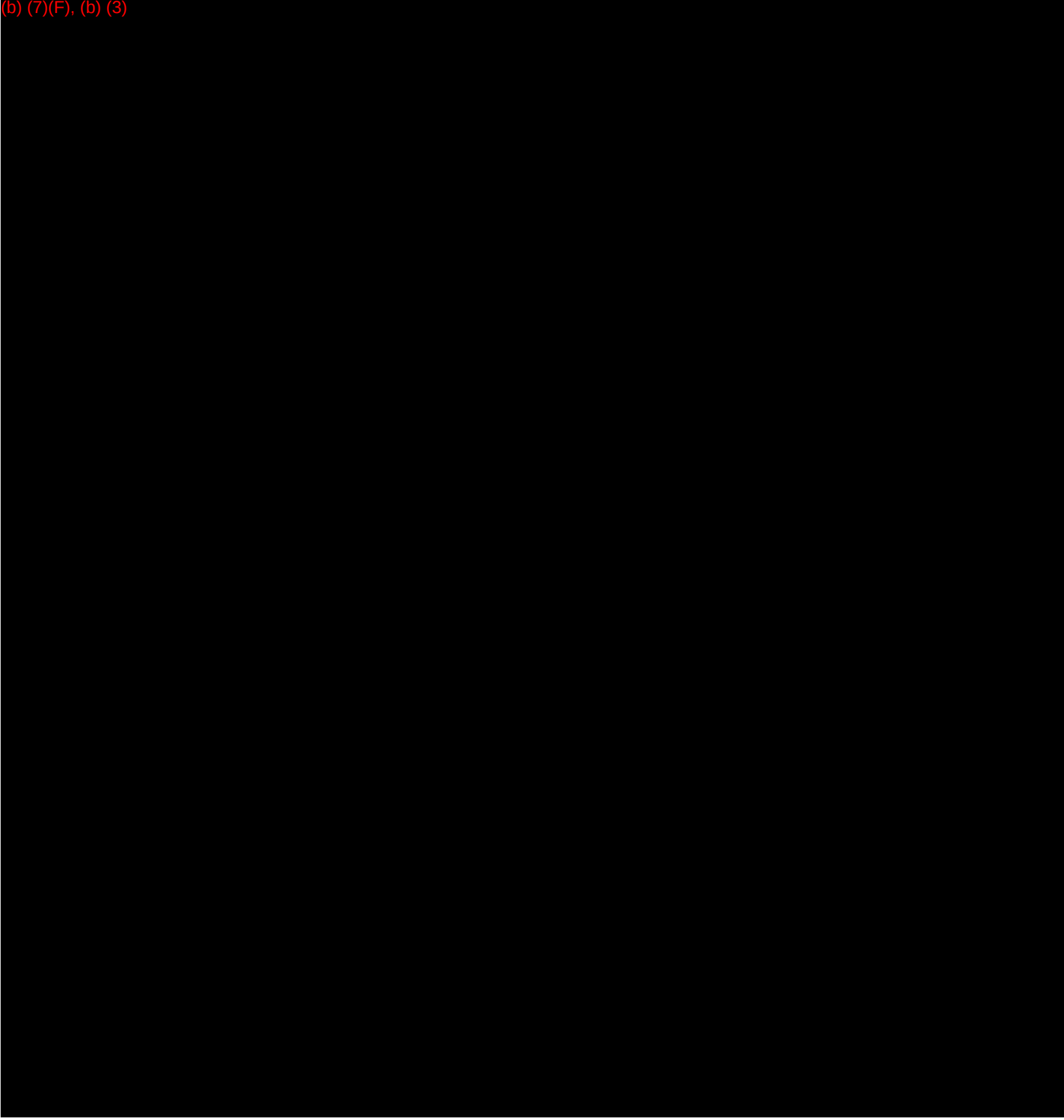


FIGURE PS05.1
PUMP STATION 5 TANK SPILL SCENARIO MAP

(b) (7)(F), (b) (3)

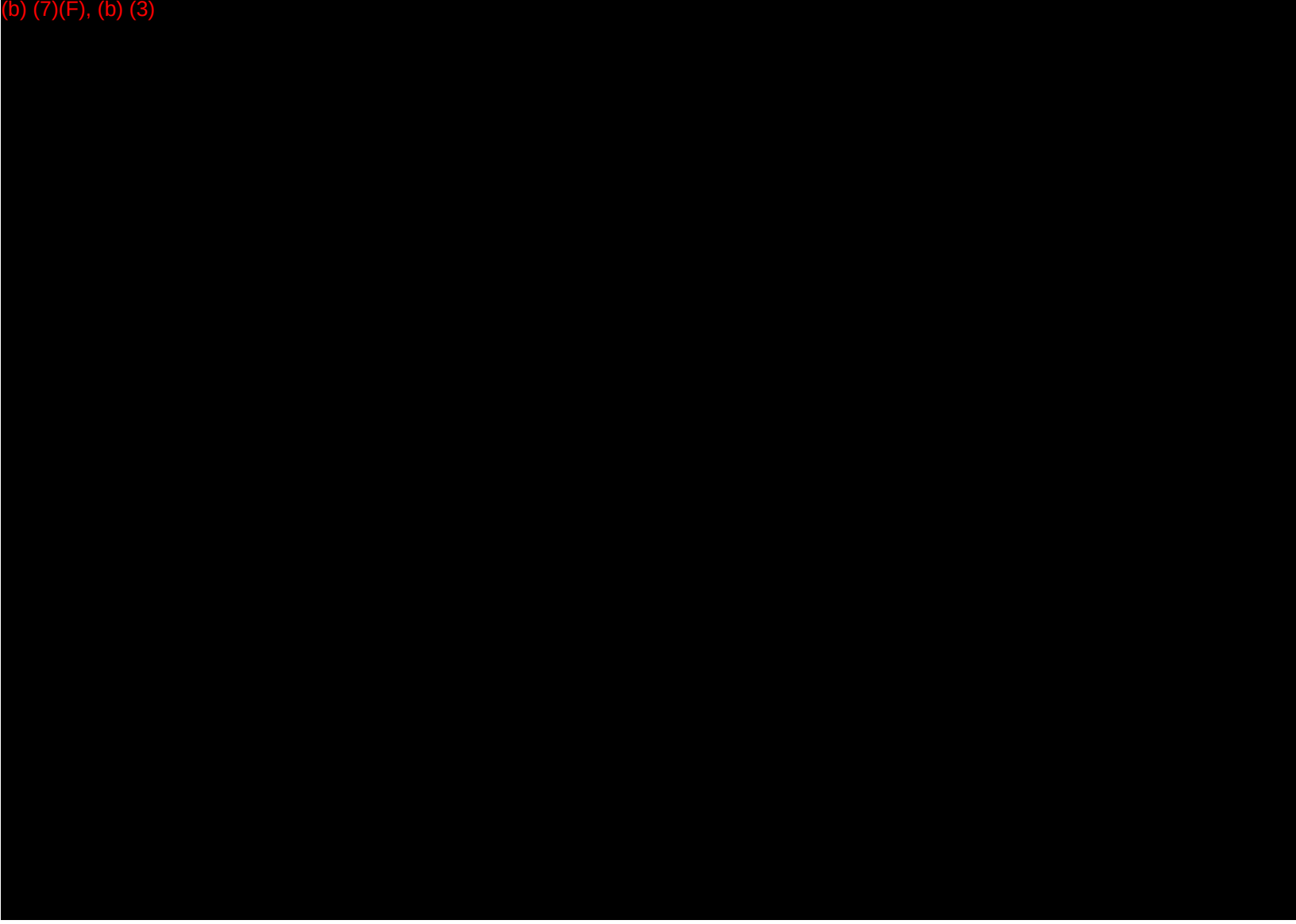


FIGURE PS05.2
PUMP STATION 5 TANK SPILL SCENARIO DEPLOYMENT MAP

TABLE PS05.1 PUMP STATION 5 TANK SPILL SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1200-1300) May 5	Hour 1-4 Day 1 (1300-1600) May 5	Hour 4-8 Day 1 (1600-2000) May 5	Hour 8-20 Day 1 (2000-2400); Day 2 (0000-0800) May 5 and 6	Hour 20 + Day 2 (0800) + May 6 +
Situation/Status • **Weather** • **Environmental**	Spring season. Winds from S at 10 mph. Temperature 35ºF. No precipitation. Tank 150 is overfilled. 10,000 barrels of oil are discharged into the secondary containment area. Approximately 1,000 barrels escape through the northwest tank farm gate valve which has been left partially open.	Oil flows north/northwest off of the pump station pad and parallels the pipeline right-of-way (ROW) to a low water crossing just north of BL1. The oil flows under the ROW to two CMPs that go under the Dalton Highway. Approximately 100 barrels get past the Dalton Highway before the culverts are blocked. The oil escaping containment flows into the Jim River.			
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site security: safety, site control, surveillance.	Review initial safety assessment. A site safety assessment is conducted to ascertain the immediate threat to the personnel at the pump station. The Incident Commander places the pump station on notice that an evacuation may be required.			
	Restrict the spread of spilled oil on land.	If it is safe to do so, Tank 150 is de-inventoried. Restrict the spread of spilled oil.			
	Restrict the spread of oil on water.	Deploy task forces. Mobilize resources to maximize containment and recovery. Restrict the spread of oil in the Jim River. Track oil movements.			
	Protection of sensitive areas and wildlife.	Protect anadromous fish, waterfowl and nesting habitats. Initiate ESA identification and prioritization process. Jim River and its tributary, Prospect Creek are considered critical habitat.			
	Agency and stakeholder notification.	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	The first responder to the spill site brings air monitoring equipment and completes an initial site safety assessment. The information is radioed to the Incident Commander and is used to ascertain the immediate threat to the personnel at the pump station and verify that all responders have appropriate personal protective equipment (PPE) before entering the spill site. The Incident Commander places the pump station on notice that an evacuation may be required.	The RBS, Safety Officer, and Environmental Coordinator requested out of Galbraith Maintenance Base arrive at Prospect Response Base at T + 2 hours. A site safety analysis utilizing the "Site Safety and Control Analysis" (Form ICS 201-5) is completed to provide identification of potential hazards, personal protective equipment requirements, establishment of decontamination for responders. All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is > 20%, additional fire and safety precautions are initiated to eliminate ignition sources. Incipient level fire suppression equipment is provided on site. This may include a fire truck(s), wheeled			
	If it is safe to do so, Tank 150 is de-inventoried. Oil is injected into the mainline. The RBS, Safety Officer, and Environmental Coordinator are requested out of Galbraith Maintenance Base. The helicopter from Galbraith Maintenance Base/PS04 is used to transport these individuals to Prospect Response Base. The Prospect Response Base fire crew and fire truck are requested to mobilize to the tanks farm.	150-pound extinguishers and hand-held extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires utilizing high volume handlines. The fire truck from Prospect Response Base arrives at T +1 hour, is manned and positioned in the vicinity of the tank farm with a two-man firefighting crew. A 400-lb wheeled extinguisher is positioned at the Dalton Highway containment site for emergency use.			

TABLE PS05.1 (CONTINUED) PUMP STATION 5 TANK SPILL SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1200-1300) May 5	Hour 1-4 Day 1 (1300-1600) May 5	Hour 4-8 Day 1 (1600-2000) May 5	Hour 8-20 Day 1 (2000-2400); Day 2 (0000-0800) May 5 and 6	Hour 20 + Day 2 (0800) + May 6 +
Discharge Tracking	The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by air, on the ground, or both. Aerial tracking is done visually by helicopter.	On the ground tracking is done by containment and recovery operations personnel who establish the extent of spread of the spilled oil. In the initial response, tracking reports are made to the incident command center via radio on an hourly basis at least.		As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.	
Protection of Environmentally Sensitive Areas (ESAs)	The Jim River and its tributary, Prospect Creek, are anadromous fish streams and considered to be critical habitat. They are sensitive all year because of the presence of Chinook salmon. Waterfowl nesting occurs on ponds, lakes, streams, and rivers throughout this segment. Important nesting habitats are in the Jim River area. There is a raptor nest site on the lower Jim River, 7 miles west of the pipeline.				
Response Actions	The Yukon Response Base P&CM assumes the position of Initial Incident Commander and the Prospect Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the Yukon Response Base P&CM transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.	A Prospect Response Base responder drives to containment site CS4-33 to evaluate the possibility of deploying boom at this location. The Jim River is in full flood with velocities of 8 feet per second or 5.5 mph. The river is out of its banks and is flooding into surrounding timber. It is determined that it is not safe to deploy boom or vessels into the river. The Prospect Response Base responder joins Task Force 1 after completing this ground reconnaissance.	The Mobile Command Post arrives with the "Go Team".		
	An aerial reconnaissance is conducted of the Jim River by a responder from Prospect Response Base. The leading edge of the oil on the river is tracked and mapped and potential containment sites are scouted. No suitable sites are identified.				
Communications	Response command and control communications would be conducted over hand-held and vehicle/boat radios. The areas of response operations are in close proximity to PS05 and in line of sight. Portable radio repeater sets may be needed if response operations are conducted below CS4-26. A Communications Plan will be developed and issued as part of the Incident Action Plan(s).				
Task Force 1 **Containment at Dalton Highway**	Three Prospect Response Base responders are mobilized to stop the flow of oil under the Dalton Highway. Four responders are requested and mobilize from Ga braith Maintenance Base for the night shift. ETA is T + 4 hours. One vac truck with an operator is mobilized from the Yukon Response Base. Another vac truck is mobilized from PS07 by a Fairbanks Response Base operator.	A containment and recovery operation is established on the Dalton Highway. Warning signs are placed on the Dalton to notify vehicular traffic of congestion and work activity. Culvert blocks are placed in the 24" and 30" CMPS going under the Dalton Highway due north of the access road to OMS91-3.1A.The Prospect Response Base aerial reconnaissance responder joins the three Prospect Response Base responders to complete Task Force 1 work. The Yukon Response Base vac truck arrives at T + 2 hours. A pump is set up by the responders to be used, if needed, to move water across the road and avoid having water/oil overtopping the road. The Komara Disc Skimmer will be used to recover oil and minimize the volume of water recovered. The Komara has a nameplate capacity of 50 gpm and a derated capacity of (b) (7)(F), bph. Approximately 900 barrels are contained at this location and are recovered within 72 hours. Recovered oil is taken via vac truck to the PS05 Injection Pump Building for reinjection into the pipeline	Response personnel will be housed at PS05 using the Permanent Living Quarters (PLQ) and the mobile camp quarters. Additional room units can be moved from PS03 within 72 hours if needed. Vehicle, and other response equipment maintenance and support will be provided by the equipment maintenance depot at PS05. Four Galbraith Maintenance Base responders travel by helicopter and arrive at T+4 hours for the night shift. The PS07 vac truck arrives at T + 5 hours.	The Galbraith Maintenance Base night shift takes over containment and recovery.	Recovery operations continue and are completed by T + 48 hours.

TABLE PS05.1 (CONTINUED) PUMP STATION 5 TANK SPILL SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1200-1300) May 5	Hour 1-4 Day 1 (1300-1600) May 5	Hour 4-8 Day 1 (1600-2000) May 5	Hour 8-20 Day 1 (2000-2400); Day 2 (0000-0800) May 5 and 6	Hour 20 + Day 2 (0800) + May 6 +
Task Force 2 **Containment at Tank Farm**	Four responders are requested from Fairbanks Response Base for the night shift. ETA is T + 5 hours. Two Prospect Response Base responders conduct responder work in the Tank Farm. One, wearing appropriate personal protective equipment completely closes the gate valve on the tank farm drain. Another responder operates a backhoe.	The Prospect Response Base backhoe operator digs sumps at the end of the tank farm drain spillways and lined. The manually operated gate valves are opened as required to allow oil to flow into the sumps. A 4-inch diaphragm pump is used to pump the oil into the Injection Pump Building sump, located due east of Tank 150. The 4-inch diaphragm pump has a nameplate pumping capacity of 871 bph and a derated capacity (20%) of 174 bph.	Once gross oil is removed, contaminated soils will be excavated and disposed of through Alyeska's contaminated soils program. Four Fairbanks Response Base responders arrive at T +5 hours for the night shift.	Night shift takes over containment and recovery and continues working until 0800 when day shift takes over.	Recovery of oil from the secondary containment is completed by T + 72 hours. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.
		A wildlife response operation is immediately initiated as outlined in Volume 1, Section 1.6.11, "Wildlife Protection." The Environment Unit takes the following steps: 1. CCI is requested to provide 10 wildlife hazers and to mobilize the wildlife treatment center from Fairbanks. CCI wildlife hazers begin mobilizing to Prospect Response Base. 2. The Alaska Clean Seas wildlife response center on the North Slope is made operational. 3. The International Bird Rescue Research Center (IBRRC) out of Berkeley, California, is notified and requested to mobilize a full scale hazing operation as well as a capture and stabilization operation. This includes making the Anchorage wildlife facility operational.	The IBRRC arrives on location within 24 hours and takes over coordination of overall wildlife response operation.	Wildlife hazers from CCI arrive on site with the wildlife treatment center at T + 10 hours.	
Task Force 4 **Waste Disposal**			Solid waste will be segregated and placed in clear bags: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area in an old material site as close to Pump Station 5 as is practical. This soil will be thermally remediated on site.		
Shoreline Cleanup					During the days that follow, cleanup activities focus on the oil remaining along the shorelines of the Jim River and other affected drainages. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. Oiled gravel on the workpad is stored in a temporary lined area for later cleaning or incineration and reuse.

TABLE PS05.1 (CONTINUED) PUMP STATION 5 TANK SPILL SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1200-1300) May 5	Hour 1-4 Day 1 (1300-1600) May 5	Hour 4-8 Day 1 (1600-2000) May 5	Hour 8-20 Day 1 (2000-2400); Day 2 (0000-0800) May 5 and 6	Hour 20 + Day 2 (0800) + May 6 +
Shoreline Cleanup (continued)					The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel mixed with peat, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge with recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are utilized to recover deeper pools of oil when possible. Oiled peat slurries may be removed by small loaders and transported to stable areas for cleaning. Peat outcrops will be raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about 2 weeks, the shoreline cleanup crews recover about one-half of the oil volume estimated to remain onshore after initial recovery efforts are completed. The initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations of resources and other organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE PS05.2 PUMP STATION 5 TANK SPILL SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1200-1300								Hour 1-4 1300-1600							Hour 4-8 1600-2000						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity bbl				No.	Capacity (bbl/hr)	No.	Capacity bbl				No.	Capacity (bbl/hr)	No.	Capacity bbl
Security	Site Control	Security	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1	1	--	Helicopter (1)[4]	--	--	--	--	1	--	1 helicopter (1)[4]	--	--	--	--	1	--	1 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	1	Note 5	--	--	--	--	--	--	Note 5	--	--	--	--	--	--	Note 5	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--		--	--	--	--	--	--	1 Prospect Response Base fire truck (2)	--	--	--	--	--	--	1 Prospect Response Base fire truck (2)	--	--	--	--
Safety	Site Safety and Control[6]	NA	--	--	--	Helicopter (1)	--	--	--	--	1	--	--	--	(b) (7) (F), (b) (3)	--	(b) (7) (F), (b) (3)	1	--	--	--	(b) (7) (F), (b) (3)	--	--
	Containment at Dalton Highway	TF-1									6	Prospect Response Base vac truck (1)[8] Yukon Response Base vac truck (1)	4-in centrifugal pump c/w 300 feet of hose Komara 12K skimmer Culvert blocking materials from lumber pallet Helicopter (1)	1		4		6 plus 4 person night shift from Ga braith Maintenance Base	Prospect Response Base vac truck (1)[8] Yukon Response Base vac truck (1) PS07 vac truck (1)	4-in centrifugal pump c/w 300 feet of hose Komara 12K skimmer Culvert blocking materials from lumber pallet				
	Containment at Tank Farm	TF-2	2	2	Backhoe (1)[8]	4-in diaphragm pump c/w 1,000 feet of hose	--	--	--	--	6	Backhoe (1)[8]	4-in diaphragm pump c/w 1,000 feet of hose	--	--	--	--	6 plus 4 person night shift from Fairbanks Response Base	Backhoe (1)[8] 2 ea. 60-ft x 40-ft liners	4-in diaphragm pump c/w 1,000 feet of hose	--		--	
	Wildlife Response	TF-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
	Waste Disposal	TF-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mobile Command Post	Communication Support	Comms.	0	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Mobile Command Post (12)	--	--	--	--
Personnel Total			Note[7]	4	1	1					15	4	4					23	4	15				
Mechanical Equipment Total					1	2						4	6						4	5				

TABLE PS05.2 PUMP STATION 5 TANK SPILL SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 8-20 2000-0800								Hour 20+ 0800+						
							Skimmers[3]		Storage[3]					Skimmers[3]		Storage[3]	
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	No.	Capacity (bbl/hr)	No.	Capacity bbl	People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	No.	Capacity (bbl/hr)	No.	Capacity bbl
Security	Site Control	Security	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1	1	--	1 helicopter (1)[4]	--	--	--	--	1	--	1 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	--	Note 5	--	--	--	--	--	--	Note 5	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	1 Prospect Response Base fire truck (2)	--	--	--	--	--	--	1 Prospect Response Base fire truck (2)	--	--	--	--
Safety	Site Safety and Control[6]	NA	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--
	Containment at Dalton Highway	TF-1	6	6 plus 4 person night shift	Prospect Response Base vac truck (1) Yukon Response Base vac truck (1) PS07 vac truck (1)	4-in centrifugal pump c/w 300 feet of hose Komara 12K skimmer Culvert blocking materials from lumber pallet	1	32	4	95 total	6 plus 4 person night shift	PS05 vac truck (1) Yukon Response Base vac truck (1) PS07 vac truck (1)	4-in centrifugal pump c/w 300 feet of hose Komara 12K skimmer Culvert blocking materials from lumber pallet	1	32	4	95 total
	Containment at Tank Farm	TF-2	6	6 plus 4 person night shift	Backhoe (1) 2ea. 60-ft x 40-ft liners	4-in diaphragm pump c/w 1,000 feet of hose	--	--	--	--	6 plus 4 person night shift	Backhoe (1) 2 ea. 60-ft x 40-ft liners	4-in diaphragm pump c/w 1,000 feet of hose	--	--	--	--
	Wildlife Response	TF-3	10	10 CCI	Wildlife treatment center	--	--	--	--	--	10 IBRRC 10 CCI	Wildlife treatment center	--	--	--	--	--
	Waste Disposal	TF-4	--		--	--	--	--	--	--	--	--	--	--	--	--	
Mobile Command Post	Communication Support	Comms.	--	--	--	Mobile Command Post (12)	--	--	--	--	--	--	Mobile Command Post (12)	--	--	--	--
Personnel Total			Note 7	33	4	15					43	4	15				
Mechanical Equipment Total					4	5						4	5				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

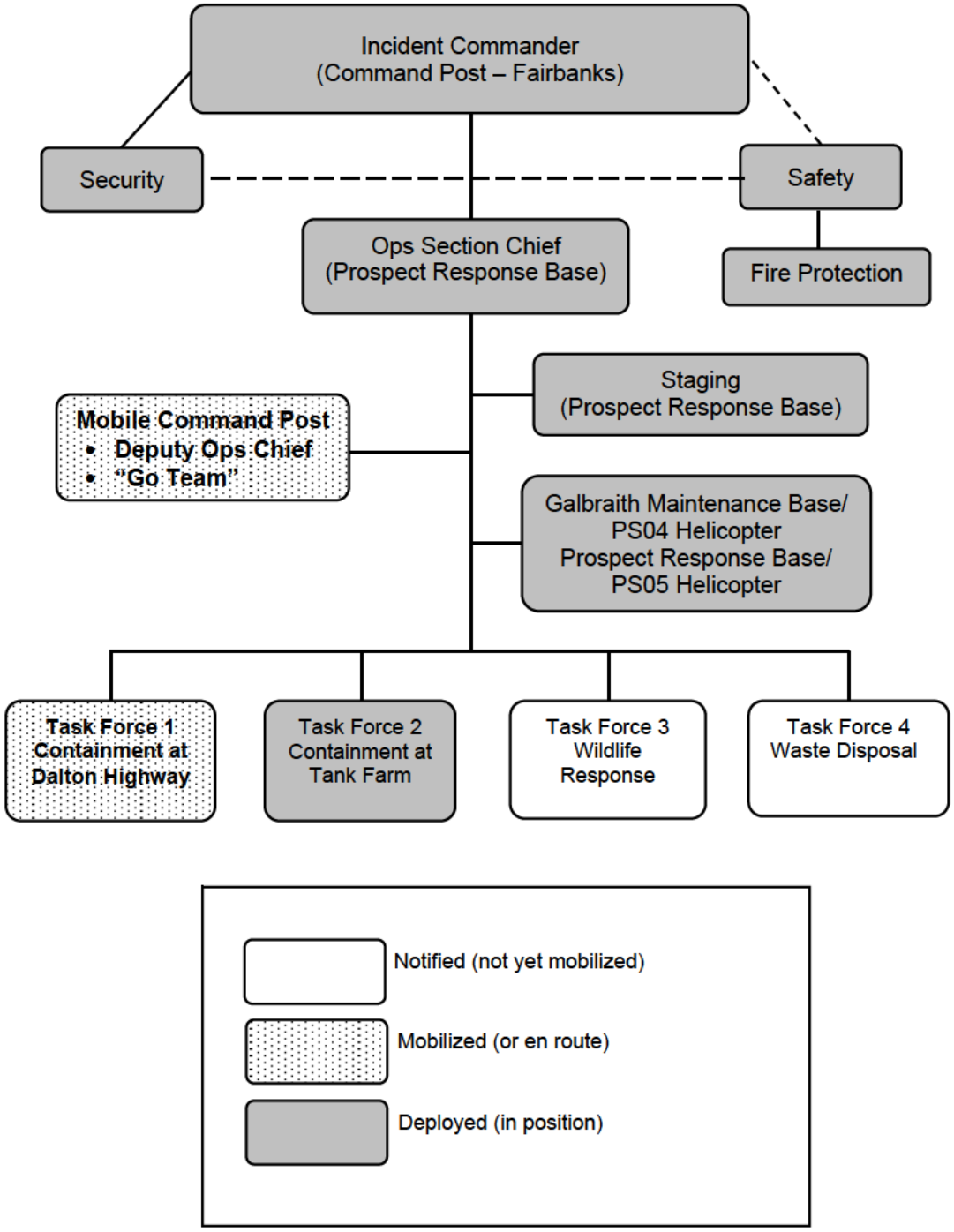


FIGURE PS05.3
PUMP STATION 5 TANK SPILL SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

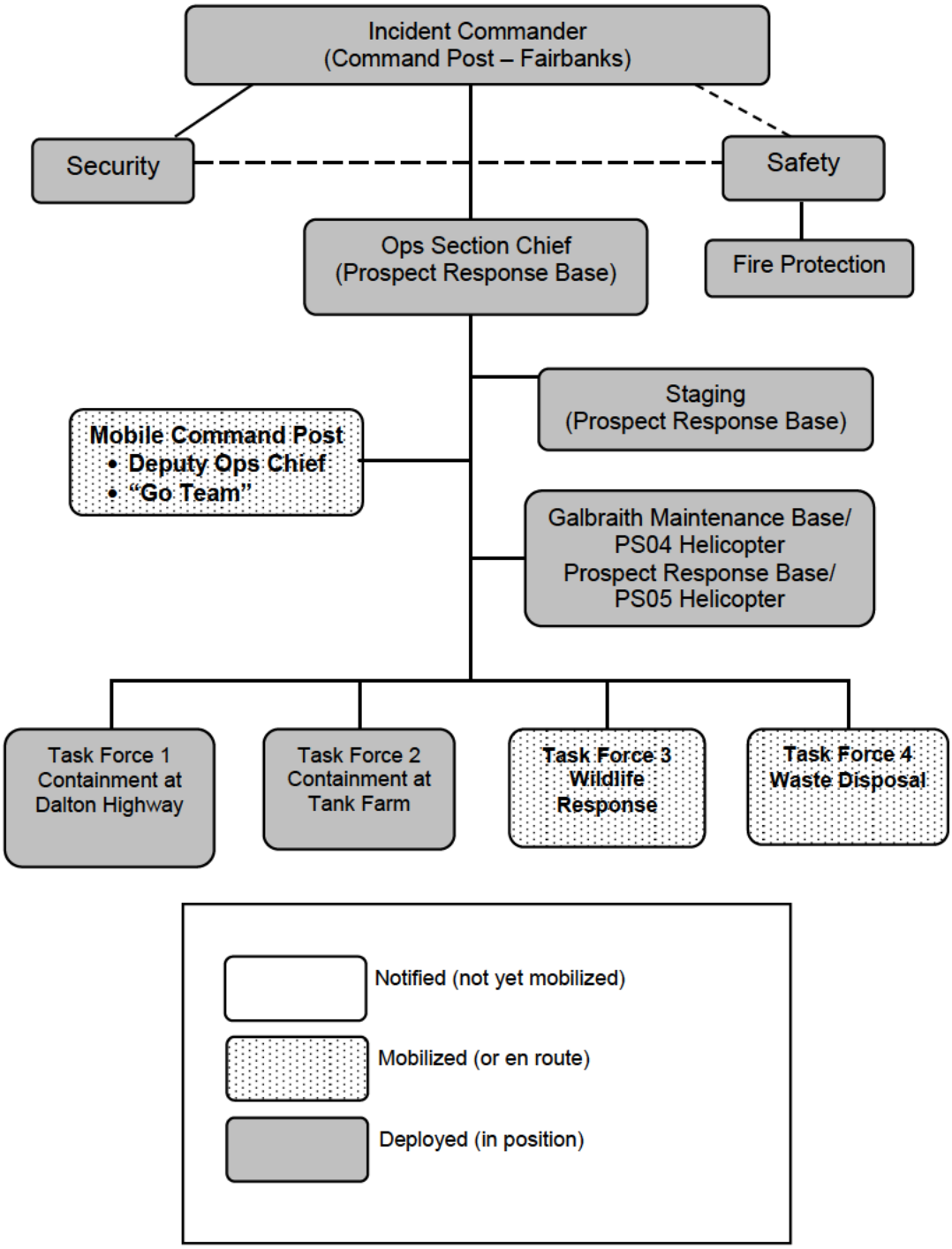


FIGURE PS05.4
PUMP STATION 5 TANK SPILL SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-4

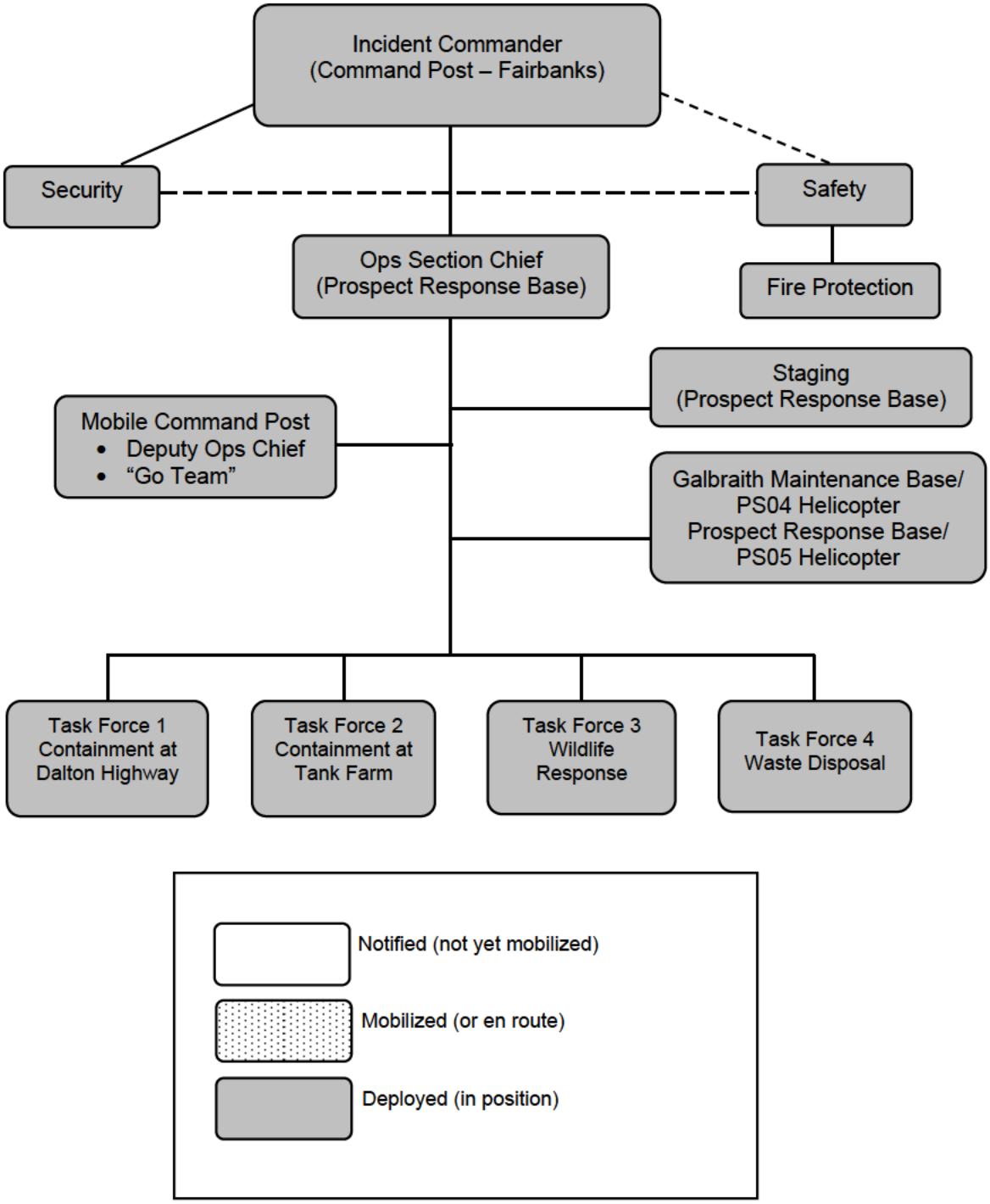


FIGURE PS05.5
PUMP STATION 5 TANK SPILL SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 4+

TABLE PS05.3 PUMP STATION 5 TANK SPILL SCENARIO
TASK FORCE 1--RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT DALTON HIGHWAY

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
4 inch centrifugal pump c/w 300 feet of hose	Prospect Response Base	Pump water across the road to keep water/oil from overtopping the road	T + 1 hr
Culvert blocking materials from lumber pallet for two culverts	Prospect Response Base	Stop the flow of oil under the Dalton Highway	T + 1 hr
Komara 12K skimmer	Prospect Response Base	Recovery of oil	T + 1 hr
1,000-gallon open tanks (4)	Prospect Response Base	Temporary storage	T + 1 hr
4,200 gallon Vac truck (operator is part of 4-man crew)	Prospect Response Base	Hauling of recovered oil	T + 1 hr
4-man crew (TF-1) Prospect Response Base Responders	Prospect Response Base	Operate and maintain equipment	T + 1 hr
4-man crew (TF-1) for night shift	Galbraith Maintenance Base	Run the night shift	T + 4 hr
Vac truck (4,200 gallons) with an operator from Yukon Response Base	Yukon Response Base	Hauling of recovered oil	T + 2 hr
4,200 gallon Vac truck with an operator from Fairbanks	PS07	Hauling of recovered oil	T + 5 hr
400 b wheeled fire extinguisher	Prospect Response Base	Fire Suppression	On site
Helicopter	Prospect Response Base	Reconnaissance	T + 0.5 hr

TABLE PS05.4 PUMP STATION 5 TANK SPILL SCENARIO
TASK FORCE 2--RESOURCE MOBILIZATION FOR RECOVERY OF OIL CONTAINED IN THE TANK FARM

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
4-inch diaphragm pump c/w 1,000 feet of hose	Prospect Response Base	Pump recovered oil to Injection Pump Building sump	On site
Backhoe (operator included in 2-man crew)	Prospect Response Base	Dig a containment sump outside of the secondary containment	On site
60-foot x 40-foot liners (2)	Fairbanks Response Base	Line sumps	T + 5 hr
2-man crew (TF-2) Prospect Response Base Responders	Prospect Response Base	Operate and maintain equipment	On site
4-man crew (TF-2) Galbraith Maintenance Base Responders	Galbraith Maintenance Base	Operate and maintain equipment for day shift	T + 4 hr
Helicopter	Galbraith Maintenance Base	Transport Ga braith Maintenance Base EC, Safety, and P&CM. Transport Ga braith Maintenance Base responders.	T + 2 hr and T + 4 hrs
4-man crew (TF-2) for night shift , including backhoe operator	Fairbanks Response Base	Run the night shift	T + 5 hr
Fire Truck with 2 firefighters and extinguishers	Prospect	Fire suppression	T + 1 hr

TABLE PS05.5 PUMP STATION 5 TANK SPILL SCENARIO SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table PS05.5. Of the 1,000 barrels that escape the secondary containment, 900 barrels is retained above the blocked culverts at the Dalton Highway. Downgradient of the Dalton Highway, the oil travels approximately 1,000 feet through a seasonal drainage to reach the Jim River. Approximately 50 barrels are expected to be deposited along the banks of this drainage and the remaining 50 barrels are expected to be deposited along the banks of the Jim River. Estimated emulsification rates are shown in Table PS05.5. Recovery of the 100 barrels of oil trapped on the shorelines is expected to begin after T + 72 hours, therefore no recovery is shown in the table.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Cumulative Oil Recovered (bbl)							
			4 hr	12 hr	24 hr	36 hr	48 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)										

Scenario 7. Fed Creek/North Fork Ray River

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from a structural failure of a longitudinal weld.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures FED.1 and FED.2)
3. Timeline matrix (Table FED.1)
4. On-site resource tally sheet (Table FED.2)
5. Response organization charts (Figures FED.3 through FED.7)
6. Resource mobilization tables (Tables FED.3 through FED.7)
7. Summary of oil fate and estimated recovery table (Table FED.8)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the site location and a deployment map that shows containment site, task force, and staging area locations (Figures FED.1 and FED.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table FED.1). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table FED.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures FED.3 through FED.7). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables FED.3 through FED.7). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table FED.8).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be

expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 7 – FED CREEK/ NORTH FORK RAY RIVER 56,233-Barrel Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3) The response planning standard volume for a spill from a section of aboveground pipe at (b) (7)(F), (b) (3)) (b) caused by a guillotine cut is calculated as shown in Section 5 of *CP-35-1 Volume 1* using the equation from 18 AAC 75.436.

Source

A guillotine cut occurs in a section of aboveground pipe.

Environmental Conditions

Time	1100	**Wind**	8 mph, from E
Season	Summer – July 15	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	75ºF
Visibility	No precipitation	**Tide/Current**	Fed Creek – 1.3-1.5 feet per second (fps) North Fork of Ray River (also known as No Name Creek) – 1 fps

Environmental Considerations – Ray River Contingency Area, Segment 1

The North Fork of the Ray River, also known locally as No Name Creek, is an important fish stream containing burbot, sculpin, grayling, northern pike, whitefish, sheefish, sucker fish, and lake chub. It is considered critical habitat and is sensitive from April through November. Fed Creek is a seasonal grayling stream sensitive during open-water months.

Moose, black bear, and caribou are widely distributed throughout the area. Ponds, lakes, streams, and rivers provide nesting habitat for waterfowl. Raptors are present in the area.

Assumptions

1. A guillotine cut occurs in a section of aboveground pipeline, spilling oil on land and eventually to water.
2. Pipeline fail-safe controls operate properly.
3. Oil drains completely from pipeline by T + 1 hour.

SCENARIO 7 – FED CREEK/ NORTH FORK RAY RIVER
(b) (7)(F), (b) (3) [redacted]

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1.1, and 4.3.3	Contain and recover oil at containment site (CS) 5-17 and immediate surrounding area will be by construction of Mega-Secur Water Dams and containment boom. Recovery of spilled oil will be by multiple pumps, skimmers and portable storage tanks.	Volume 2, Table FED.5
Volume 3, Section 4.1.1, and 4.3.3	Installation of additional containment along Fed Creek and the North Fork of the Ray River will be by construction of Mega-Secur Water Dams and containment booming. Recovery of spilled oil will be by use of multiple pumps, skimmers and portable storage tanks.	Volume 2, Table FED.3 and Table FED.4

Support Action Taken

Notification is made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table FED.1).

Actions

Actions are based on the above noted notifications, a number of simultaneous response actions begin.

1. The pipeline is shut in. Remote gate valves (RGVs) 57 and 58 are closed.
2. A responder conducts an initial assessment of the spill by Prospect Response Base/PS05 helicopter and radios the information to Prospect Response Base.
3. Safety and security measures are initiated.
4. The Prospect O&M assumes the position of Initial Incident Commander (IIC) and the Prospect Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the Prospect Response Base O&M transfers the Incident Commander position to a member of the Fairbanks IMT and of the OC assumes Deputy Operations Section Chief. The Incident Command Post is established at the FEOC in Fairbanks.

SCENARIO 7 – FED CREEK/ NORTH FORK RAY RIVER
(b) (7)(F), (b) (3)

5. Requests are made for the following resources:

   A 4-person response crew from the (Yukon Response Base), Task Force (TF-1), is mobilized by land to the Operations Materials Site (OMS)(b) (7)(F), (b) (3)

   TF-2 is made up of 3 responders from Prospect Response Base. Two of the responders travel by Prospect Response Base/PS05 helicopter conducting the initial aerial assessment, and are dropped of(b) (7)(F), (b) (3)

   A 4-person response crew from Fairbanks (TF-3) is mobilized to(b) (7)(F), (b) (3) to install an Mega-Secur Water Dam at CS5-17.

   A 5-person response crew from Fairbanks Response Base (TF-4) is mobilized to the low water crossing (LWC) of Fed Creek at(b) (7)(F), (b) (3)

   The Stevens Village/Rampart crew (6-person crew) is mobilized to provide additional support to TF-2.

   A 20-person night shift is requested from the baseline contractor to report to the Yukon Response Base by 1700.

6. Vac trucks and additional response equipment are requested from Prospect Response Base, Yukon Response Base, and Fairbanks Response Base.

7. The Ship Escort/Response Vessel System (SERVS) 8-person response team, the Alaska Clean Seas (ACS) 10-person response team, and baseline contractor management are notified and requested to begin mobilizing personnel to the Yukon Response Base for dispatch to the spill site. Baseline contractor is requested to recall all off-duty response personnel and to notify the labor unions for call-out of additional personnel for both day and night shifts. The Fairbanks IMT is notified and assembled, and makes preparations to assume overall command of the incident operating from the Fairbanks Emergency Operations Center. The Fairbanks IMT Personnel Unit Leader begins notifying linewide off-duty pump station personnel and recalls them to Fairbanks for dispatch to the spill site.

Oil Trajectory

The initial outflow of oil flows to the west of the pad and then flows south, parallel to the pad, over gently sloping terrain toward the low water crossing at Fed Creek, approximately 0.5 miles away. Approximately 11,088 barrels of oil is trapped on land before reaching Fed Creek. The leading edge reaches Fed Creek at approximately T + 36 minutes. Due to the small size of Fed Creek (2- to 5-feet wide), the oil overflows the channel of Fed Creek to a width of approximately 20 feet. Approximately 36,000 barrels of oil is absorbed on 12 acres of floodplain along the sides of Fed Creek. The oil flows along Fed Creek, a slow-moving shallow stream, at a rate of 1.5 fps to its mouth at the North Fork of the Ray River. The leading edge reaches the first Mega-Secur Water Dam installed at OMS 328.5 after the Mega-Secur Water Dam is installed; however, due to the large amount of oil in the channel, approximately 4,500 barrels overflows this Mega-Secur Water Dam. The oil that overflows the first Mega-Secur Water Dam travels along the North Fork of the Ray River at 1 fps until it reaches the second Mega-Secur Water Dam at the(b) (7)(F), (b) (3)) where it is contained. 3,636 barrels of oil is trapped on land along the sides of the North Fork of the Ray R ver before reaching the Mega-Secur Water Dam a(b) (7)(F), is estimated that the stream flow course distance between the pipeline point of release and the North Fork of the Ray R ver is 5 miles. The leading edge of the spill will reach the mouth of Fed Creek at the North Fork of the Ray River at approximately T + 7 hours. The oil that overflows the first Mega-Secur Water Dam at th (b) (7)(F), (b) (3) y vac trucks and skimmer systems.

Oil trapped on land between the release point and Fed Creek is estimated to be 11,088 barrels. Approximately 39,636 barrels of oil is trapped on land along Fed Creek and the North Fork of the Ray River. The remaining oil is contained at the Mega-Secur Water Dam on Fed Creek (4,578 barrels) and the Mega-Secur Water(b) (7)(F), (b) (3)). No oil reaches the containment site at CS5-17.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In any actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment",* or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

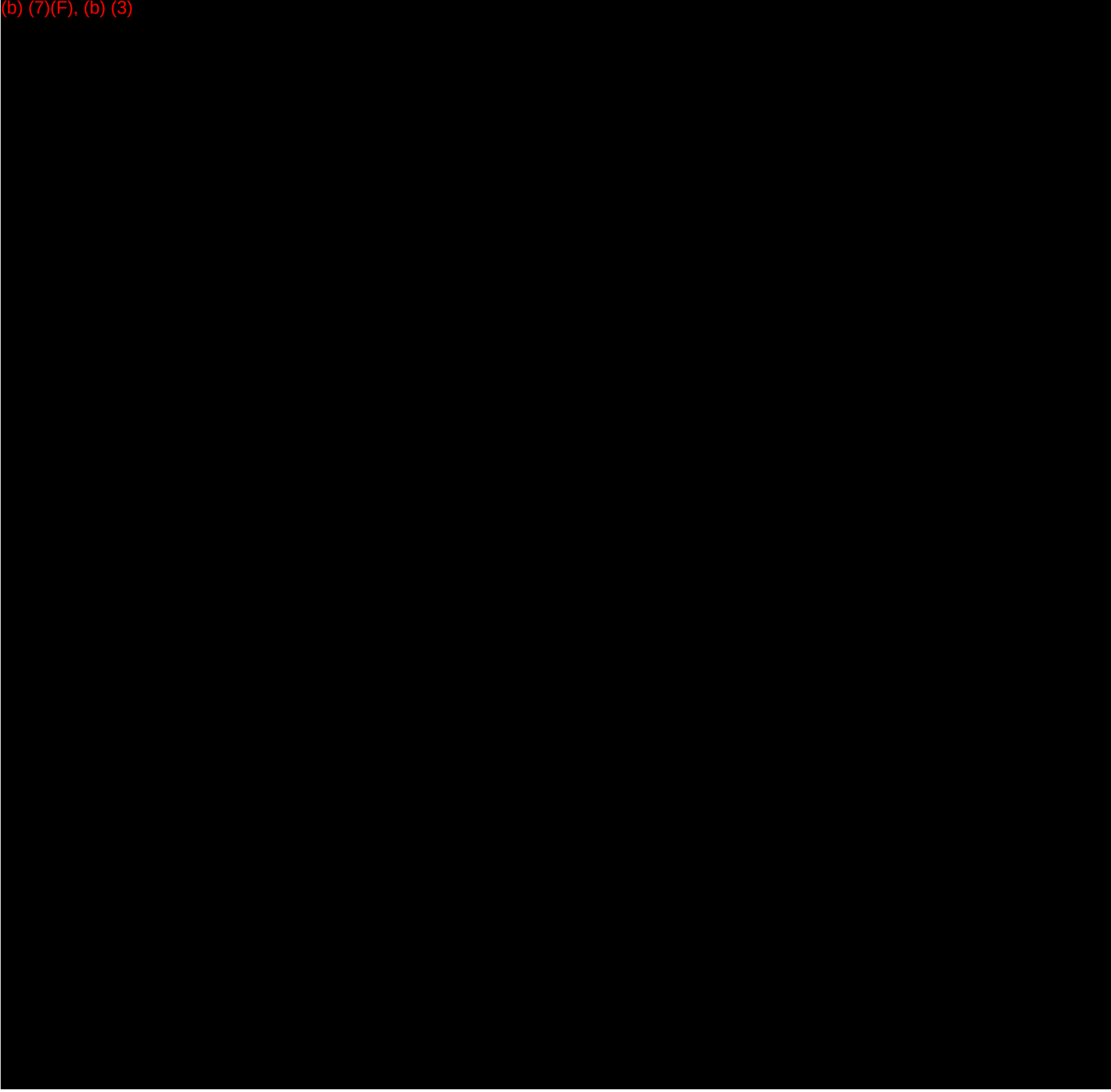


FIGURE FED.1
FED CREEK/NORTH FORK RAY RIVER SCENARIO MAP

(b) (7)(F), (b) (3)

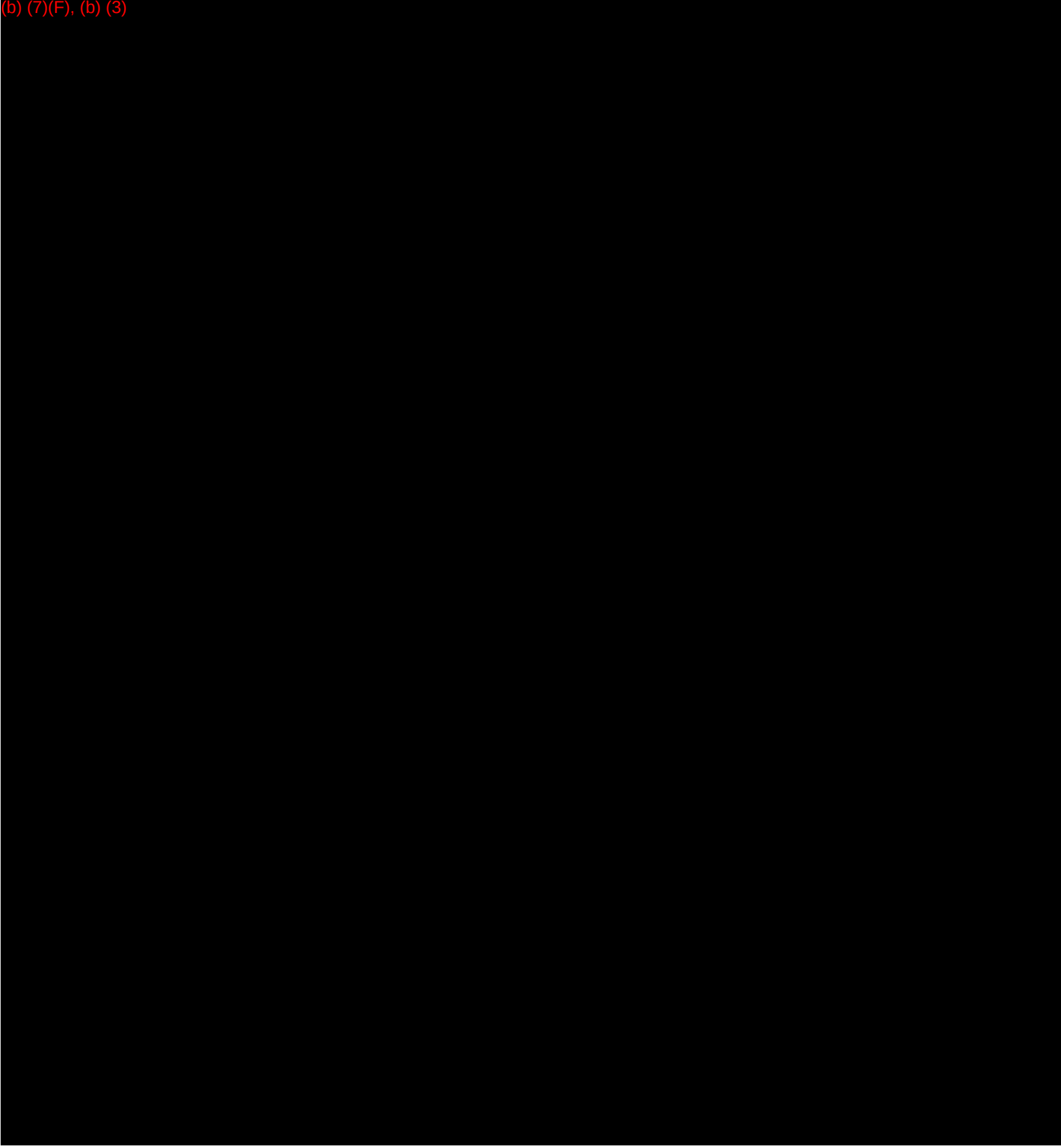


FIGURE FED.2
FED CREEK/NORTH FORK RAY RIVER SCENARIO DEPLOYMENT MAP

TABLE FED.1 FED CREEK/NORTH FORK RAY RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (00000600)
Situation/Status • **Weather** • **Environmental**	Summer season. Winds from east at 8 mph. Temperature 75º F. Oil released from the guillotine cut just north of RGV 57 flows to the west of the pad into a small channel with a 50-foot floodplain. The oil flows in the channel to the south, parallel to the work pad, toward the low water crossing (LWC) at Fed Creek, approximately 0.5 miles away. The leading edge reaches Fed Creek at approximately T + 36 minutes. Approximately 11,100 barrels of oil is retained in 3.7 acres of vegetated floodplain upstream of the Fed Creek confluence. At about T + 36 minutes, oil begins to enter Fed Creek, a slow-moving shallow stream, at a rate of 1.3 fps toward the North Fork of the Ray River. With a bank floodplain width of about 20 feet estimated, the initial depth of oil is estimated to be 4.6 feet. The oil in the damaged segment of pipeline drains completely before the end of Hour 1. Water levels in Fed Creek and the North Fork of the Ray River are at normal height. No weather changes that could affect the stream conditions are predicted for the first 72 hours.	Oil continues to flow downstream along Fed Creek and over its banks at about 1.3 fps.	Oil continues to flow downstream along Fed Creek and over its banks at about 1.3 fps.	The leading edge of the spill arrives at the initial containment site of opportunity (see TF-1 details) at approximately T + 5.1 hours. Because of upland (bank and floodplain) absorption of oil, approximately 37,900 barrels has so far been absorbed in about 12.6 acres upstream of the site. The oil arrival rate is about 50.3 cubic feet per second initially, equaling 537 barrels per minute, with an arrival depth of about 2.5 feet. At the first containment site, about 50 percent of the oil arriving is retained, and the other 50 percent flows over or by the Mega-Secur Water Dam containment.	The leading edge reaches the mouth of Fed Creek at T + 7 hours and flows into the North Fork of the Ray River (also known as No Name Creek). The oil that overflows the first inclined culvert travels along the North Fork of the Ray River at 1 fps. The leading edge of oil reaches the pipeline work pad bridge (b) (7)(F), (b) (3)
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site security: safety, site control, surveillance.	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, and develop and implement leading edge tracking.			
	Cleanup and countermeasures on land.	Investigate cause; stop source if safe. Initiate containment of as much oil on land as poss ble through use of dikes, berms, and shore guardian boom.			
	Cleanup and countermeasures on water.	Deploy task forces, mobilize resources to maximize containment and recovery. Contain as much oil as possible near the release point. Initiate free oil containment and recovery, and evaluate in-situ burn opportunities at containment areas. Track oil movements.			
	Protection of sensitive resources and wildlife.	Initiate ESA identification and prioritization process. The North Fork of the Ray River is an important fish stream.			
	Stakeholder communications and engagement.	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). In addition, Alyeska owner company representatives are notified and consulted. This notification is followed up with a hard copy.			
Fire Prevention, Control, and Safety	The ARFF Fire Truck from Prospect Response Base is mobilized, complete with a two-man fire fighting crew. The Fairbanks Response Base fire foam skid is mobilized, complete with a two-man fire fighting crew. The ARFF Fire Truck and fire foam skid are notified while en route to report t (b) (7)(F), (b) (3) .	Safety: Upon the arrival from Prospect Response Base to the recovery site for TF-1 (Operations Materials Site [OMS] (b) (7) , the Safety Officer conducts a site safety analysis. The "Site Safety and Control Analysis" (Form ICS 201-5) is used to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. In addition, safety objectives for other areas of the response, such as air operations and ground transportation, begin to be addressed. A decontamination wash van is brought to the site to provide adequate decontamination for all task forces. Dry decontamination is conducted at individual containment sites. Dry decontamination consists of the removal and disposal of PPE, initial boot wipe down, and wash up with waterless skin cleaner. Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL exceeds 20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of non-sparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include wheeled 150-lb extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. The primary mission of firefighters is personnel safety and protection. The ARFF Fire Truck from Prospect Response Base arrives at the OMS (b) (7)(F), with TF-1 and takes up position to assist with incipient fire suppression and personnel protection as needed.	Additional Safety Officers are requested by the IMT to support operations at TF sites. Safety Officers are identified at ACS, SERVS and additional Alyeska locations, then dispatched to the Yukon Response Base for assignment. The Mobile Command Post is dispatched from Fairbanks to assist with on-scene management of response operations. While en route, it is directed to report to the OMS at (b) (7)(F), to set up the on-site command post.	The Fairbanks Response Base fire foam skid arrives at the Fed Creek LWC with TF-4 and gets in position to assist with incipient fire suppression and personnel protection as needed.	

TABLE FED.1 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (00000600)
Discharge Tracking	The tracking of spilled oil is intended to provide both strategic and tactical information to the responders. Tracking will be done by air, on the ground, or both. Aerial tracking will be done visually by helicopter. On-the-ground tracking will be done by containment and recovery operations personnel who will establish the extent of spread of the spilled oil. In the initial response, tracking reports will be made to the Incident Command Post via radio at least on an hourly basis. As the containment and recovery operation is established and the risk of spread is reduced, less frequent reports will be provided.	The Incident Commander tracks discharge on a situation status map in the Emergency Operations Center (EOC) and the Incident Commander tracks the location via radio and situation status maps. Tracking reports are made to the Incident Command Post via radio on an hourly basis at least.	All of the oil in the pipeline segment flows out by Hour 1.		As containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.
Protection of Environmentally Sensitive Areas (ESAs)	The On-Scene Incident Commander identifies containment of oil before it reaches the Ray River as the priority objective.				
Response Actions	Operations Control Center (OCC) received a low-pressure alarm and PS07 went down on low suction pressure at 1100, causing the line to be shut down. The Prospect Response Base RBS completes an initial assessment of the spill by helicopter and radios the information to Prospect Response Base. This is completed by T + 1 hour. OCC contacts the Fairbanks Duty Officer. The Duty Officer notifies the Fairbanks Senior Vice President and the Pipeline Manager. Prospect Response Base RBS assumes the position of Initial Response Incident Commander. Requests are made for the following resources: • A 4-person response crew (3 plus 1 P&CM) from Yukon Response Base (TF-1). • A 3-person response crew from Prospect Response Base (TF-2). • A 4-person response crew from Fairbanks Response Base (TF-3). • A 5-person response crew from Fairbanks Response Base (TF-4). • A 6-person crew from Stevens Village/Rampart to provide additional support to TF-2. • A 20-person night shift from baseline contractor to report to Yukon Response Base by 1700. • A 10-person crew from ACS and an 8-person crew from SERVS to support recovery operations. Baseline contractor is requested to recall all off-duty response personnel and notify labor unions for the call-out of additional personnel for both day and night shifts. The Fairbanks IMT is notified and assembled. The IMT makes preparations to assume overall command of the incident, operating from the Fairbanks Emergency Operations Center. The Fairbanks IMT Personnel Unit Leader begins notifying line-wide off-duty pump station personnel and recalls them to Fairbanks for dispatch to the spill site.	OCC: Federal and State agencies are notified (ADEC, NRC, BLM, and ADNR), as well as Alyeska owner company representatives. Yukon Response Base security is requested to close the Dalton Highway south of 81-APL-4. Prospect Response Base security is requested to close the Dalton Highway north of 83-APL-3. DOT is notified and requested to notify northbound traffic out of Fairbanks at the Steese Highway weigh station of the highway closure. Containment and recovery task force personnel submit tracking reports to the Incident Command Post via radio on an hourly basis. Communication support equipment such as portable radio repeaters will be deployed to support the message traffic between task forces and the On-Scene Command. Initial response message traffic will be relayed using response vehicle radios positioned at high points near the release point. Portable radio repeater sets will be deployed within 12 hours of the initial response according to the Incident Action Plan, Communications Plan developed for the second shift. The minimum number of portable repeaters for this area is one set. Two more portable repeaters may be needed depending on actual deployment locations of containment and recovery sites or staging areas.	The MCP arrives at [redacted] with Fairbanks, allowing for on-site command.		Emergency repair equipment for the Fairbanks Initial Response Team from Fairbanks is mobilized with source control as well as repair equipment to repair the failed section of pipe.

TABLE FED.1 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (00000600)
Staging Areas and Task Force Mobilization	Staging areas are established at the OMS 82-0, OMS at 328.5, and Yukon Response Base. The following resources are mobilized: • A 4-person response crew (3 plus 1 P&CM) from Yukon Response Base (TF-1) to report directly to the RBS at PLMP 382.5 for deployment to the creek near the OMS. • A 3-person response crew from Prospect Response Base (TF-2) to report to the bridge at (b) (7)(F), • A 4-person response crew from Fairbanks Response Base (TF-3) to report to the bridge at Dalton Highway (b) (7)(F), (b) (3) • A 5-person response crew from Fairbanks Response Base (TF-4) to report to LWC of Fed Creek (b) (7)(F), • A 6-person crew from Stevens Village/Rampart to provide additional support to TF-2. • A 20-person night shift is requested from baseline contractor to report to the Yukon Response Base by 1700. • A 10-person ACS crew and an 8-person SERVS crew are to report to the staging area at (b) (7)(F), The Safety Officer and Environmental Coordinator are mobilized from Fairbanks Response Base, to report to the staging area at (b) (7)(F), • Alyeska Central Warehouse (ACW) Staging Area Managers dispatched to manage all three staging areas. • The Fairbanks helicopter may be mobilized and staged for operations support, if needed.			Portable tank with helicopter fuel is brought to the site.	
Response Actions **Task Force 1** **Containment and Recovery at Fed Creek (b) (7)(F),**	TF-1 is dispatched from the Yukon Response Base to initiate response actions at Fed Creek near the OMS a(b) Staging area is identified at OMS east of (b) (7)(F), to support TF-1. Additional helicopter landing site at OMS 82-0 may be used to support TF-1 operations. A land use permit for access to Fed Creek (b) (7)(F), is requested.	TF-1 arrives at OMS near (b) (7)(F), with 26-foot summer response trailer as well as D-7 and D-3 dozers on the rollback trailer. Response Team begins to clear a 1,100-foot trail down to Fed Creek from the east point of the OMS approximately 4 miles downstream from the Fed Creek LWC.	TF-1 establishes trail to Fed Creek from OMS at (b) (7)(F), Dozer establishes a landing zone near creek for delivery of response equipment. Native soil is stockpiled. Mega-Secur dam is set up and installed. Helicopter begins delivery of response equipment such as tankage, recovery systems and other supplies not brought in by trail. Dozer begins at T + 4.5 hours to remove brush from area for portable storage. Portable storage is set up. Fire boom is deployed upstream of the containment as a contingency.	Leading edge of the oil arrives at T + 5 hours. Recovery operations are begun, using equipment from the 26-foot summer response trailer and support vehicles that are staged at OMS a(b) (7)(F), . Additional storage is delivered by helicopter to the containment site. Trail is developed using native soils to support rubber-tired vehicles.	Transition to Fairbanks Response Base night shift. Recovery operations are continued with pumps and hoses into portable storage. Additional storage/tank farm is set up at the recovery site and at OMS a(b) (7)(F), . Evaluation of in-situ burning options begins at both the MCP and EOC located at Fairbanks.
Response Actions **Task Force 2** **Containment and Recovery at (b) (7)(F), (b)**	A 3-person response team (TF-2) from Prospect Response Base is notified to mobilize to PLMP 329.5 bridge to construct Mega-Secur Water Dam, skimmer, and storage systems. Two personnel mobilize immediately with the Prospect helicopter and conduct an initial assessment within an hour. The third team member travels by road.	The third team member joins the first two members at T + 2 hours at the (b) (7)(F), and begins constructing the Mega-Secur Water Dam. Staging Area at OMS 82-0 is designated to support TF-2. OMS 82-0 is a sand pit and can be a source of sand, if needed.	Recovery equipment is deployed to site. Stevens Village/Rampart crew (6-person crew) arrives at T + 5 hours to support TF-2. Vac trucks begin arriving from Prospect Response Base and Fairbanks Response Base at T + 4 hours. Portable storage arrives from Prospect Response Base at T + 4 hours.	Mega-Secur Water Dam is completed at T + 6 hours. Leading edge of oil arrives at (b) (7) at T + 6-7 hours.	Leading edge of oil arrives a(b) (7)(F), at T + 10 hours. Transition to Fairbanks night shift. Recovery operations continue using vac trucks, pumps, and hoses. Vac trucks transport recovered oil to(b) for injection into Tank 150. Portable storage is also set up to continue recovery operations while vac trucks are in transit to Prospect Response Base. K&W tankers and 300-barrel vac trucks arrive at T + 12 hours and start transporting recovered oil (b) 5.
Response Actions **Task Force 3** **Containment and Recovery at CS5-17**	A 4-person crew (TF-3) out of Fairbanks Response Base is notified and dispatched to the Yukon Response Base an initial briefing.		TF-3 arrives at Yukon Response Base, receives initial briefing, and picks up additional response equipment such as containment materials, recovery systems, and storage tanks. They are dispatched to CS5-17 with instructions to begin construction of an Mega-Secur Water Dam at the site. In the event that water levels are above normal, boom is used to provide containment.	TF-3 arrives on site at T + 5.5 hours and begins construction of Mega-Secur Water Dam. In the event that water levels are above normal, boom is used to provide containment. Portable tankage and recovery equipment is deployed.	Mega-Secur Water Dam is in place by T + 7.5 hours. Transition to Fairbanks Response Base night shift. No oil reaches CS5-17. A minimal crew is left at CS5-17 to monitor the containment site and verify that no oil arrives at this site. Other crewmembers are re-assigned to support TF-1 and TF-2. In the event that oil arrives at CS5-17, resources would be redistributed to allow for recovery at this site and additional resources would be mobilized to CS5-16 to set up containment downstream of CS5-17.

TABLE FED.1 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1100-1200)	Hour 1-3 Day 1 (1200-1400)	Hour 3-5 Day 1 (1400-1600)	Hour 5-7 Day 1 (1600-1800)	Night Shift (Hour 7-19) Day 1 (1800-2400); Day 2 (00000600)
Response Actions **Task Force 4** **Containment and Recovery at Spill Site and Fed Creek LWC**	5-person crew out of Fairbanks Response Base (TF-4) is notified and dispatched to Fed Creek LWC.		TF-4 arrives at Yukon Response Base and picks up additional equipment such as storage systems and decontamination system to support containment operations	TF-4 arrives at Fed Creek LWC with heavy equipment at T + 6 hours. TF-4 constructs dam at Fed Creek LWC using Mega-Secur dam..	Dam completed by T + 8 hours. Transition to Fairbanks Response Base night shift. TF-4 begins constructing a berm north of Fed Creek to restrict the flow of oil into Fed Creek. Oil recovery using pumps and portable storage begins at T + 8 hours. Vac trucks start transporting oil to PS05 for injection at Tank 150.
Response Actions **Task Force 5** **Transport of Recovered Oil**	Three 100-barrel vac trucks (with operators) are requested and mobilized from Prospect Response Base, Yukon Response Base , and Fairbanks Response Base. Additional Teamsters and haul road drivers are requested from Fairbanks Response Base. Three 300-barrel vac trucks (with operators) are requested from the North Slope. Four 12,000-gallon K&W tanker trucks (with operators) are requested from Fairbanks Response Base.		One 100-barrel vac truck arrives at PLMP 329.5 at T + 4 hours and is in position to begin recovering and transporting oil to PS05.	Two additional vac trucks arrive (b) (7) and continue to recover oil and transport to PS05 for injection into Tank 150. (b)	Transition to Fairbanks Response Base night shift. Three 300-barrel vac trucks from the North Slope and four 12,000-gallon tanker trucks from Fairbanks Response Base arrive at T + 12 hours and assist in recovery and transport operations.
Waste Management **Task Force 6**				Oily waste from TF-1 through TF-5 is stored on site or in staging areas. Waste is segregated according to Alyeska and RCRA policy. The Environmental Unit in Fairbanks works with the Logistics section of the IMT to develop longer-term storage and transport plans.	Solid waste is segregated and placed into clear bags. Waste is segregated as follows: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50 percent) Contaminated soil, which is confirmed as hazardous waste, must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area in OMS 79-2. This soil will be thermally remediated on site. As the spread of oil is secured, the transport of recovered oil and oily debris will become an added focus of the Incident Action Plan.
Wildlife Protection/ Rehabilitation Task Force 7	The Wildlife Protection and Rehabilitation Plan is activated (also see “Protection of ESAs” above). Environment Unit takes the following steps: Security is requested to provide 10 wildlife hazers to work under the supervision of the Environment Unit hazing team leaders. Contractor Environment Unit is contacted to mobilize the wildlife treatment center stationed at Fairbanks.		Environment Unit takes the following steps: ACS and SERVS are placed on standby for the poss ble use of their wildlife response facilities or provision of additional hazing and/or capture and treatment equipment. The International Bird Rescue Research Center (IBRRC) out of Berkeley, California is notified and requested to mobilize a full-scale hazing operation as well as a capture and stabilization operation. This includes making the Anchorage Wildlife Facility operational.	Wildlife hazers provided by security arrive on site.	Wildlife treatment and stabilization resources from Yukon Response Base arrive at the staging area at (b) (7) .5 for poss ble use in treatment of oiled wildlife
Pipe Repair Task Force 8		Fairbanks Initial Response Team is notified to mobilize to the spill site to evaluate the damage and establish a repair plan for the pipeline.			The Fairbanks Initial Response Team, consisting of 14 individuals, arrives on site at T + 12 hours to replace the failed section of pipe. The repairs take an additional 24 hours.

TABLE FED.1 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Hour 20-26 Day 2 (0600 - 1200)	Hour 26-32 Day 2 (1200 - 1800)		Hour 32-48 Day 2 (1800 - 2400) Day 3 (0000 – 1000)
Objectives and Strategies[1]	**Objectives**	**Strategies**	**Strategies**	**Strategies**
	Site security: safety, site control, surveillance.	Control site access at road, staging locations, and highway closures. Review initial safety assessment and revise site safety plan as hazards change. Continue evaluation of surveillance needs.	Maintain site security at road locations and staging areas. Evaluate the ability to reopen the Dalton Highway for non-response travel needs. Evaluate site safety and PPE requirements. Continue evaluation of surveillance needs.	Control site access controls, review safety assessment, and revise site safety plan as hazards change.
	Clean up and countermeasures on land.	Assure containment integrity. Initiate active oil recovery from pond systems. Develop run-off control plan.	Continue cleanup and countermeasure activities. Continue to evaluate ability to establish additional recovery locations.	Continue maintaining all containment. Maximize recovery. Maximize waste management.
	Clean up and countermeasures on water.	Maintain near Pipeline containment and recovery. Actively pursue oil outside containment. Continue to identify and protect ESAs. Continue to evaluate ability to establish additional recovery locations and implement as needed.	Protection of sensitive resources and wildlife. Continue to evaluate ability to establish additional recovery locations. Continue to refine waste management plan and processes.	Continue to refine containment and recovery tactics and locations. Continue to refine waste management plan and processes.
	Protection of sensitive resources and wildlife.	Maintain ESA protections. Continue wildlife treatment and stabilization plan. Deploy bird rehabilitation center. Maintain wildlife hazing activities.		
	Stakeholder communications and engagement.	Continue Joint Incident Command (JIC), joint press releases, and conference schedule. Assist with oil movement resumption plans as requested.		
Fire Prevention, Control, and Safety	Continue to support response operations. Add additional fire suppression equipment (extinguishers) for incipient fire fighting as teams encounter oil. Evaluate site-specific safety plans for each shift or as task force duties change schedule.	Safety: Redo site assessments as conditions and operations change. Continue site monitoring as access areas are opened up. Set up additional personnel decontamination stations. Continue to support response operations through such activities as air monitoring and work cycle and ergonomics evaluation.	Safety: Continue monitoring safety roles. Continue to support response through such activities as air monitoring and work cycle and ergonomics evaluation.	Continue to support response operations through such activities as air monitoring and work cycle and ergonomics evaluation.
Discharge Tracking	Tracking reports will be made to the Incident Command Post via radio at least on an hourly basis. As the containment and recovery operation is established and the risk of spread is reduced, less frequent reports will be provided.			
Response Actions Task Force 1 Containment and Recovery at (b) (7)(F), (b) (3)	Recovery operations continue by pumping into portable storage. As oil level diminishes in the containment site, the pumps are replaced with skimmers to recover oil.	Continue recovery into portable tanks using pumps and/or skimmers. Additional recovery tanks are set up for possible decanting operations if conditions merit. Recovered oil is transferred by hose pipeline to the temporary tank farm at the OMS located a (b) (7)(F), where it is loaded into vac trucks and tanker trucks for re-injection at PS05.		Recovered oil is transferred by hose pipeline to the OMS at (b) (7)(F), where it is loaded into vac trucks and tanker trucks for re-injection at PS05. Additional work takes place to establish a vehicle trail from OMS (b) to the Fed Creek site, to reduce the need for use of the hose pipeline from the creek to the pad.
Response Actions Task Force 2 Containment and Recovery at (b) (7)(F), (b)	Continued product recovery using vac trucks and pumps. As oil level diminishes in the containment site, the pumps are replaced with skimmers to recover oil.	Continue recovery using pumps and/or skimmers into portable tankage and vac trucks. Site layout is evaluated as part of the plan to open the ROW to more traffic.		Continued recovery using pumps and/or skimmers into portable tankage and vac trucks. Site continues to be brushed and opened upstream to allow for more access to containment activities.
Response Actions Task Force 3 Containment and Recovery at CS5-17	A minimal crew continues to monitor this containment site and verify that no oil arrives at this site. As it is determined that no oil is going to reach this site, the site begins to transition into a security/site control checkpoint for road access on the Dalton Highway where it passes through the spill area.			

TABLE FED.1 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Hour 20-26 Day 2 (0600 - 1200)	Hour 26-32 Day 2 (1200 - 1800)	Hour 32-48 Day 2 (1800 - 2400) Day 3 (0000 – 1000)		
Response Actions Task Force 4 Spill Site and Fed Creek LWC	Continued product recovery using vac trucks and pumps. As oil level diminishes upstream of the blocked culvert, the pumps are replaced with skimmers to recover oil. Containment of oil trapped on land is verified.	Oil recovery continues from blocked culvert using pumps and skimmers. Recovery of oil trapped on land begins using pumps, hoses, and vac trucks, and soil removal as determined by the Environmental Unit.	Long-term plans are developed and implemented to address contaminated soil.		
Recovered Oil Transfer and Storage Task Force 5	Recovered oil is transported from the containment sites at the (b) (7)(F), and the (b) (7)(F), bridge to Tank 150 at (b) by vac truck and tanker truck. If the containment site at (b) (7)(F), is not accessible by vac truck, a portable SCR pipeline will be constructed from the containment site at Fed Creek to the pipeline corridor, where the recovered oil is loaded into vac trucks and tanker trucks for transport and re-injection at (b) .		Recovered oil is transported from the containment sites (b) (7)(F), (b) (3) by vac truck and tanker truck. If necessary, recovered oil will be pumped from portable storage at the containment site at Fed Creek to the pipeline corridor, where it is loaded into vac trucks and tanker trucks for transport and re-injection a (b)		
Waste Management Task Force 6	Order leak-proof dumpsters to store/ship waste. Set up test protocol to test for RCRA status.	As the spread of oil is secured, the transport of recovered oil and oily debris will become an added focus of the Incident Action Plan.	Continue waste disposal plan. Increase manpower as waste stream volume increases.	Begin consolidation of waste by type. Ensure drainage of waste into liner is addressed to preclude risk of overflow from rain and leak potentials.	Refine waste disposal plan to address the long-range disposal strategy I more detail. Options to dispose of waste include off-site disposal and storage capacities.	Waste management operations continue until complete.
Wildlife Protection/ Rehabilitation Task Force 7	Wildlife Hazing and Capture Unit set up. The IBRRC is on location and takes over coordination of the overall wildlife response operation.	Continue hazing, capture, stabilization, and transport activities as needed.	Minimize wildlife oiling through hazing. Continue hazing, capture, stabilization, and transport activities as needed.			
Shoreline Cleanup Plan			Begin organizing Shoreline Cleanup Assessment Technology (SCAT) teams.	Laborers start identifying additional access routes for the banks upstream from the containment sites as SCAT and Unified Command authorize.	Over a period of about 2 weeks, the stream bank cleanup crews recover approximately one-half of the oil volume estimated onshore after initial recovery efforts are completed. **SCAT Teams Deployed:** Oil remaining trapped in widely scattered pockets in the on-land area of the initial release will be dealt with over the long term. An option for recovering this oil would be to flood the area now contained in earth berms with water to float the oil. The floated oil would be corralled in containment booms and skimmed off the water. During the days that follow, cleanup activities focus on the oil remaining along the shorelines of Fed Creek and North Fork of the Ray River. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the SCAT process. Oiled gravel on the work pad is stored in a temporary lined area for later cleaning or incineration and reuse.	

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE FED.2 FED CREEK/NORTH FORK RAY RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							Hour 3-5 1400-1600						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	–	–	–	–	–	–	2	–	–	–	–	–	–	2	–	–	–	–	–	–
Discharge Tracking	Aerial Tracking[4]	--	–	–	–	1 helicopter (1)[4]	–	–	–	–	–	–	1 helicopter (1)[4]	–	–	–	–	–	–	1 helicopter (1)[4]	–	–	–	–
	Ground Tracking[5]	TF-1	–	Note[5]	–	–	–	–	–	–	Note[5]	–	–	–	–	–	–	Note[5]	–	–	–	–	–	–
Fire Protection	Fire Protection	TF-1	–	–	–	–	–	–	–	–	–	–	1 ARFF Fire Truck (2)	–	–	–	–	–	–	1 ARFF Fire Truck (2)	–	–	–	–
Safety	Site Safety and Control[6]	--	–	–	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–
[redacted]		TF-1	–	–	–	–	–	–	–	–	4	2 dozers (2)[8]	Mega-Secur Water Dam 2 chainsaws 26-ft summer response trailer 2 dozers Rollback Trailer	–	–	–	–	4	2 dozers (2)[8]	Mega-Secur Water Dam 2 chainsaws 196 ft fire boom 2,000 ft boom 2- and 3-in pumps and hoses 1 helicopter Plywood 26-ft summer response trailer	–	–	Varies	[redacted]
[redacted]	Containment and Recovery	TF-2	2	2	–	1 Helicopter (1)	–	–	–	–	3	–	Mega-Secur Water Dam 45-ft response trailer 1 Helicopter (1)	–	–	–	–	3	235-backhoe (1)[8]	Mega-Secur Water Dam 45-ft response trailer 2- and 3-in pumps and hoses Pedco 2-ft skimmer 2 Aquaguard RBS-05 skimmers 196 ft fire boom 2,000 ft boom	1 2	[redacted]	Varies	
	Containment at CS5-17	TF-3	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE FED.2 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1100-1200								Hour 1-3 1200-1400							Hour 3-5 1400-1600						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Safety	Containment	TF-4	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
(b) (7)(F), (b) (3) [redacted]																								
	Transport of Recovered Oil	TF-5	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	1 ea. 100-bbl vac truck (1)	–	–	–	–	–
	Waste Management	TF-6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Wildlife	Wildlife Hazing	TF-7	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–		–	–	–	–	–	–
On-Scene Comms.	Communication Support	Comms.	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Mobile Command Post	–	–	–	–
Personnel Total			Note[7]	4	–	1					10	2	3					10	4	5				
Mechanical Equipment Total					–	1						2	6						4	16				

TABLE FED.2 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-7 1600-1800								Hour 7-19 1800-0600							Hour 19+ 0600+						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	–	–	–	–	–	–	2	–	–	–	–	–	–	2	–	–	–	–	–	–
Discharge Tracking	Aerial Tracking[4]	DT/TF-1	–	–	–	1 helicopter (1)[4]	–	–	–	–	–	–	1 helicopter (1)[4]	–	–	–	–	–	–	1 helicopter (1)[4]	–	–	–	–
	Ground Tracking[5]	DT/TF-1	–	Note[5]	–	–	–	–	–	–	Note[5]	–	–	–	–	–	–	Note[5]	–	–	–	–	–	–
Fire Protection	Fire Protection	FP/TF-1	–	–	–	1 ARFF Fire Truck (2) 1 fire foam skid (2)	–	–	–	–	–	–	1 ARFF Fire Truck (2) 1 fire foam skid (2)	–	–	–	–	–	–	1 ARFF Fire Truck (2) 1 fire foam skid (2)	–	–	–	–
Safety	Site Safety and Control[6]	--	1	1	–	–	–	–	–	–	1	–	–	–	–	–	–	1	–	–	–	–	–	–
	[redacted]	TF-1	4	4	2 dozers (2)[8]	Mega-Secur Water Dam S 2 chainsaws 196 ft fire boom 2,000 ft boom 2- and 3-in pumps and hoses 1 helicopter (1) Plywood Portable shelter Aquaguard skimmer Pedco 2-ft skimmer 26-ft summer response trailer	1 1	[redacted]	Varies	[redacted]	14 plus 5-person night shift	2 dozers (2)[8]	Mega-Secur Water Dam 2 chainsaws 196 ft fire boom 2,000 ft boom 2- and 3-in pumps and hoses 1 helicopter (1) Plywood Portable shelter Aquaguard skimmer Pedco 2-ft skimmer 26-ft summer response trailer	1 1	[redacted]	Varies	[redacted]	14 plus 5-person night shift	2 dozers (2)[8]	Mega-Secur Water Dam 2 chainsaws 196-ft fire boom 2,000 ft boom 2- and 3-in pumps and hoses 1 helicopter (1) Plywood Portable shelter Aquaguard skimmer Pedco 2-ft skimmer 26-ft summer response trailer	1 1	[redacted]	Varies	[redacted]
	Containment and Recovery at PLMP 329 Bridge at North Fork Ray River	TF-2	9	9	235-backhoe (1)[8]	Mega-Secur Water Dam 45-ft response trailer 2- and 3-in pumps and hoses Pedco 2-ft skimmer 2 Aquaguard RBS-05 skimmers Wash van 196 ft fire boom 2,000 ft boom	1 2	[redacted]	Varies	[redacted]	17 plus 6-person night shift	235-backhoe (1)[8]	Mega-Secur Water Dam 45-ft response trailer 2- and 3-in pumps and hoses Pedco 2-ft skimmer 2 Aquaguard RBS-05 skimmers Wash van 196 ft fire boom 2,000 ft boom	1 2	[redacted]	Varies	[redacted]	17 plus 6-person night shift	235-backhoe (1)[8]	Mega-Secur Water Dam 45-ft response trailer 2- and 3-in pumps and hoses Pedco 2-ft skimmer 2 Aquaguard RBS-05 skimmers Wash van 196 ft fire boom 2,000 ft boom	1 2	[redacted]	Varies	[redacted]

TABLE FED.2 (CONTINUED) FED CREEK/NORTH FORK RAY RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-7 1600-1800								Hour 7-19 1800-0600								Hour 19+ 0600+							
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]			
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)		
	Containment at CS5-17	TF3	4	4	–	Mega-Secur Water Dam 2- and 3-in pumps and hoses Pedco 2-ft skimmer 2,000 ft boom	1	(b) (7)(F), (b)(3)	Varies	(b) (7)(F), (b)(3)	4 plus 4-person night shift	–	Mega-Secur Water Dam 2- and 3-in pumps and hoses Pedco 2-ft skimmer 2,000 ft boom	1	(b) (7)(F), (b)(3)	Varies	(b) (7)(F), (b)(3)	4 plus 4-person night shift	–	Mega-Secur Water Dam 2 and 3-in pumps and hoses Pedco 2-ft skimmer 2,000 ft boom	1	(b) (7)(F), (b)(3)	Varies	(b) (7)(F), (b)(3)		
	Containment and Recovery at Spill Site and Fed Creek LWC (PLMP 325)	TF-4	5	5	D-6 dozer(1)[8]	Mega-Secur Water Dam Sandbags, Culvert Culvert blocking kit 2- and 3-in pumps and hoses Pedco 2-ft skimmer	1		Varies		5 plus 5-person night shift	D-6 dozer(1)[8]	Mega-Secur Water Dam Sandbags, Culvert Culvert blocking kit 2- and 3-in pumps and hoses Pedco 2-ft skimmer	1		Varies		5 plus 5-person night shift	D-6 Dozer(1)[8]	Mega-Secur Water Dam Sandbags, Culvert Culvert blocking kit 2- and 3-in pumps and hoses Pedco 2-ft skimmer	1		Varies			
	Transport of Recovered Oil	TF-5	–	–	3 ea. 100-bbl vac trucks (3)	–	–	–	–	–	–	3 ea. 100-bbl vac trucks (3) 3 ea. 300-bbl vac truck (3) 4 tanker trucks (4)	Portable SCR Pipeline	–	–	–	–	–	3 ea 100-bbl vac trucks (3) 3 ea 300-bbl vac truck (3) 4 tanker trucks (4)	Portable SCR Pipeline	–	–	–	–		
	Waste Management	TF-6	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	Dumpsters	–	–	–	–		
Wildlife	Wildlife Hazing	TF-7	–	–	–	–	–	–	–	–	10 CCI	–	Wildlife treatment center	–	–	–	–	10 CCI 10 IBRRC	–	Wildlife treatment center	–	–	–	–		
On-Scene Comms.	Communications Support	Comms.	–	–	3 portable repeaters	Mobile Command Post	–	–	–	–	–	3 portable repeaters	Mobile Command Post	–	–	–	–	–	3 portable repeaters	Mobile Command Post	–	–	–	–		
Personnel Total			Note7	25	7	7					73	14	9					83	14	9						
Mechanical Equipment Total					7	26						14	28						14	28						

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8.] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

-- Not arrived on site. May be mobilized or en route.

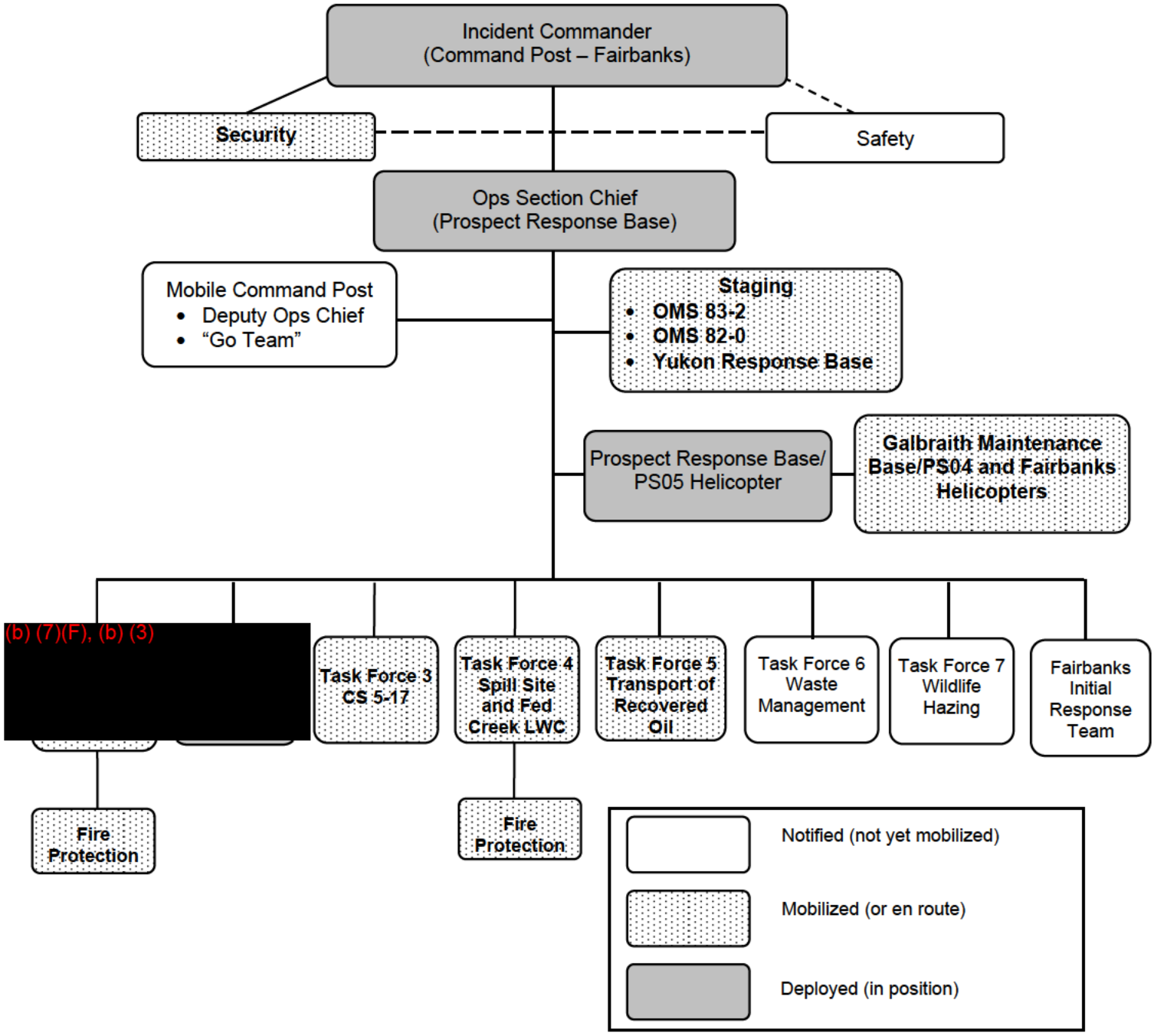


FIGURE FED.3
FED CREEK/NORTH FORK RAY RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

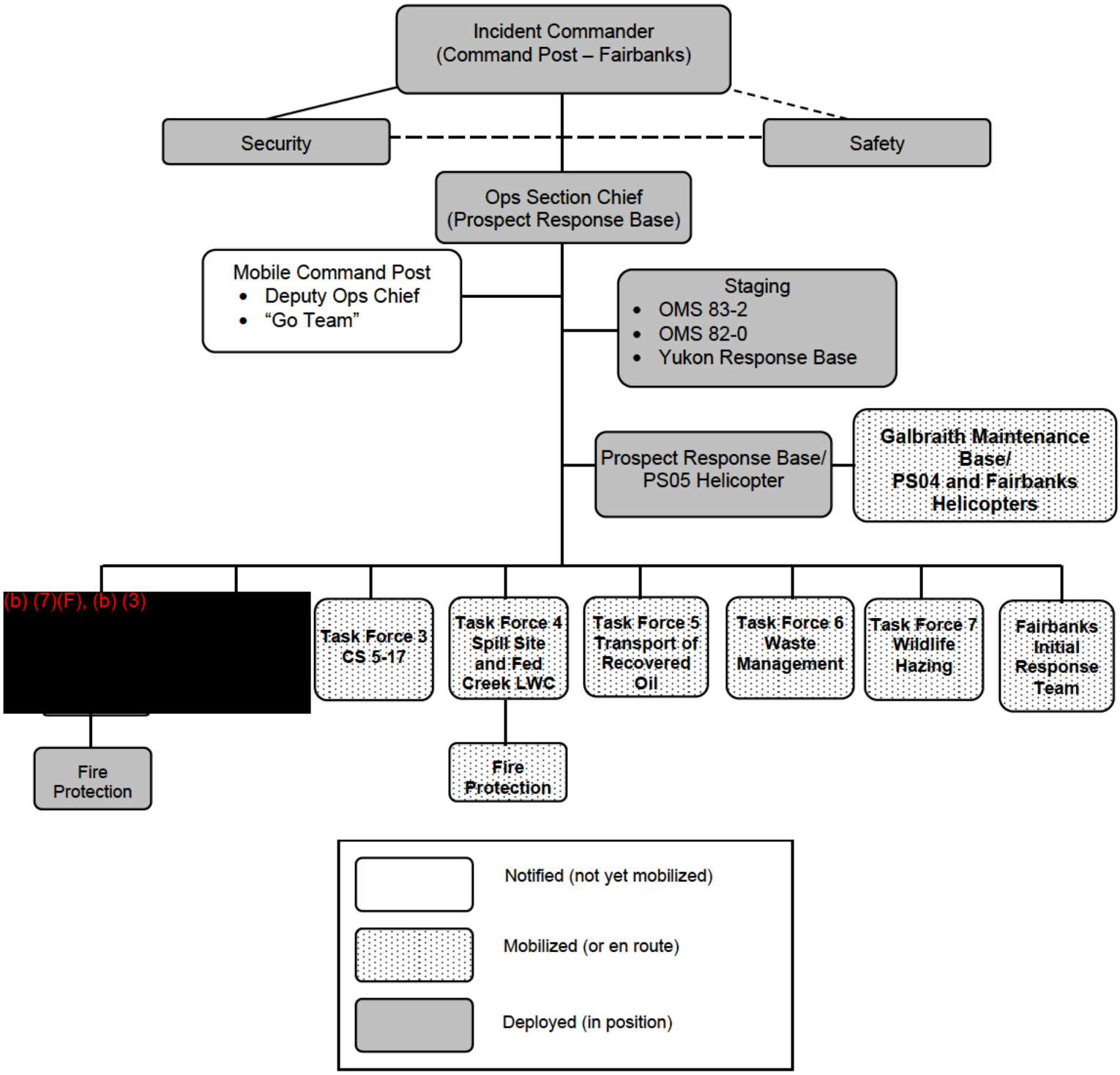


FIGURE FED.4
FED CREEK/NORTH FORK RAY RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

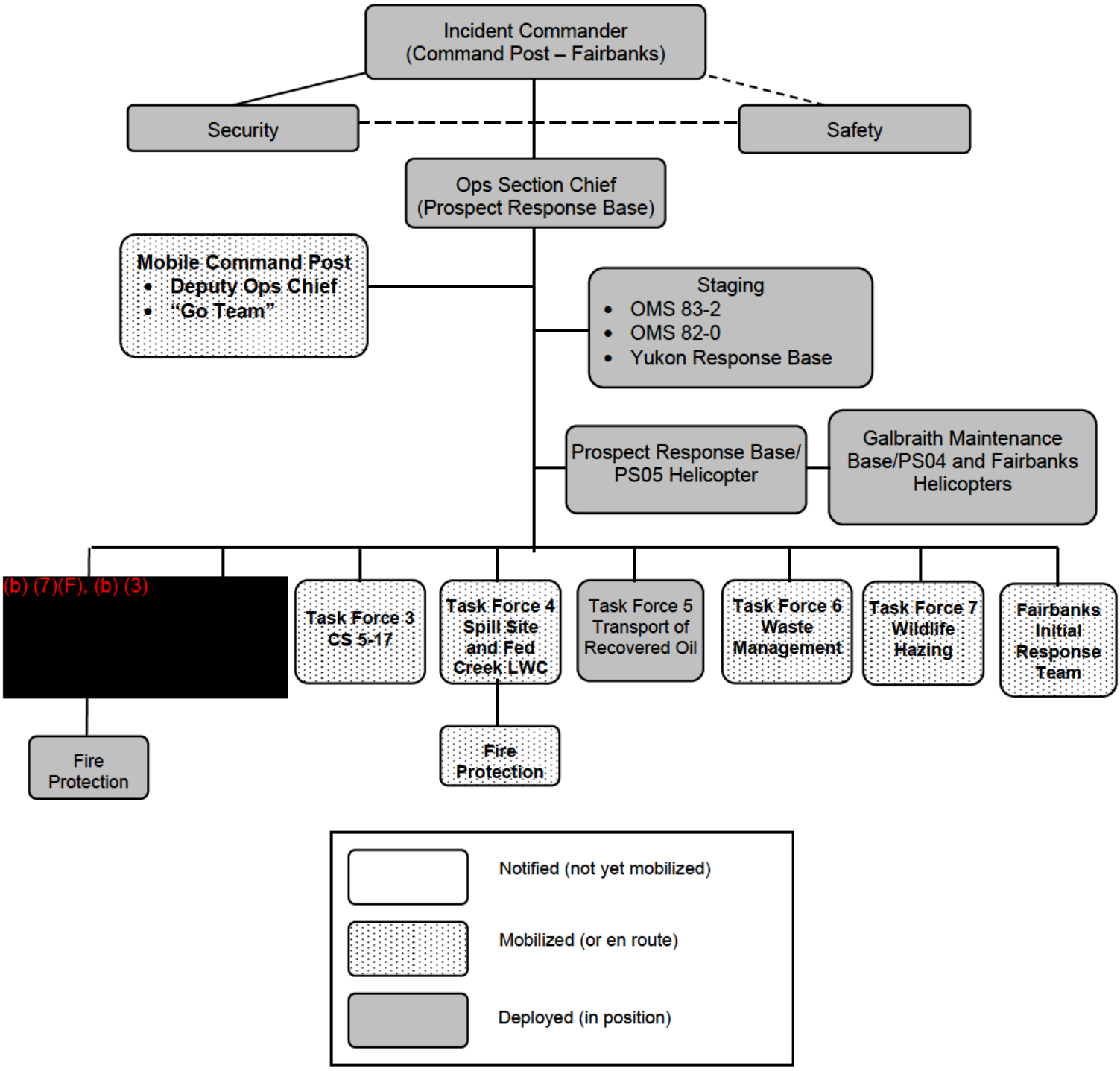


FIGURE FED.5
FED CREEK/NORTH FORK RAY RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-5

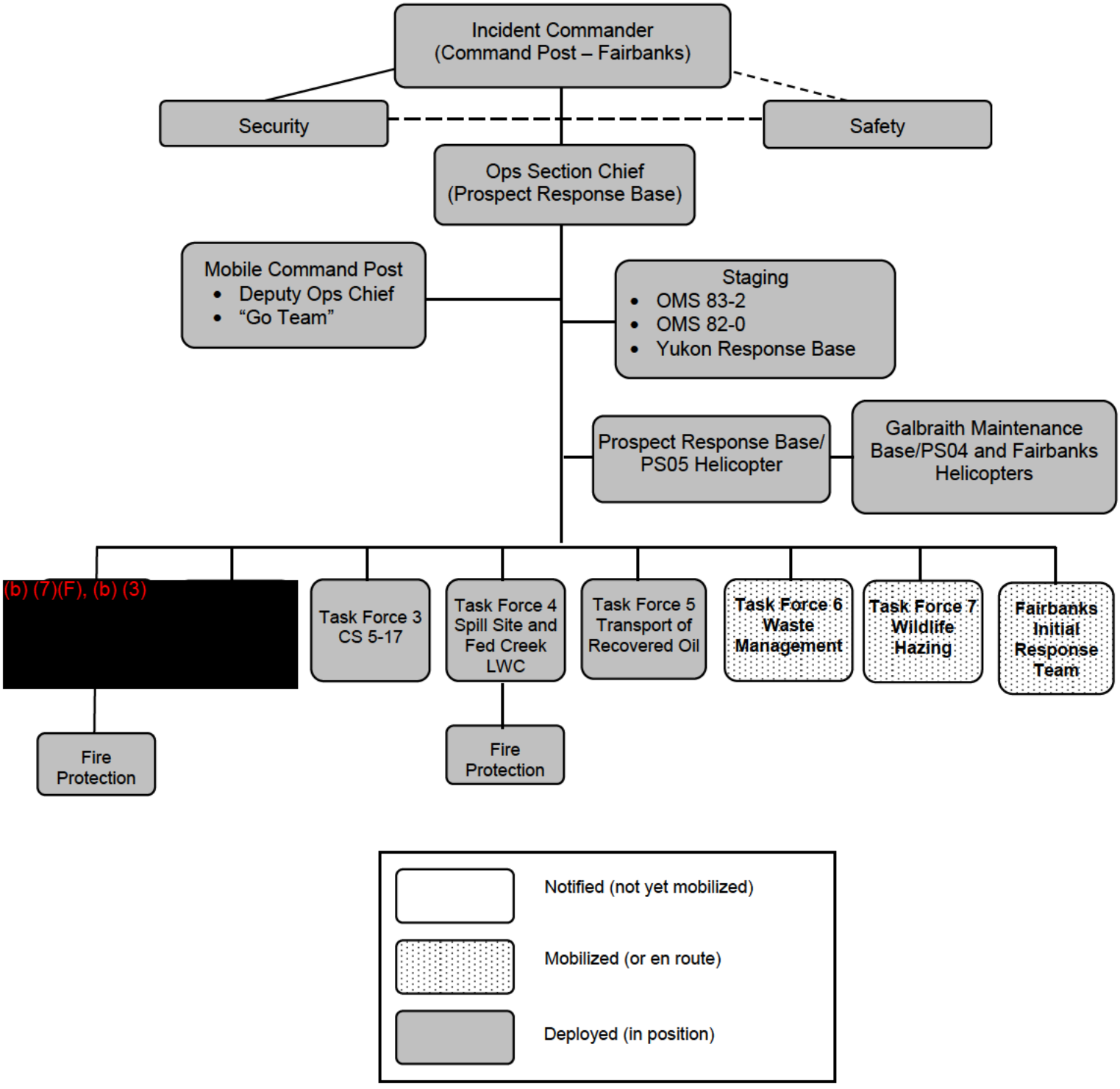


FIGURE FED.6
FED CREEK/NORTH FORK RAY RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 5-7

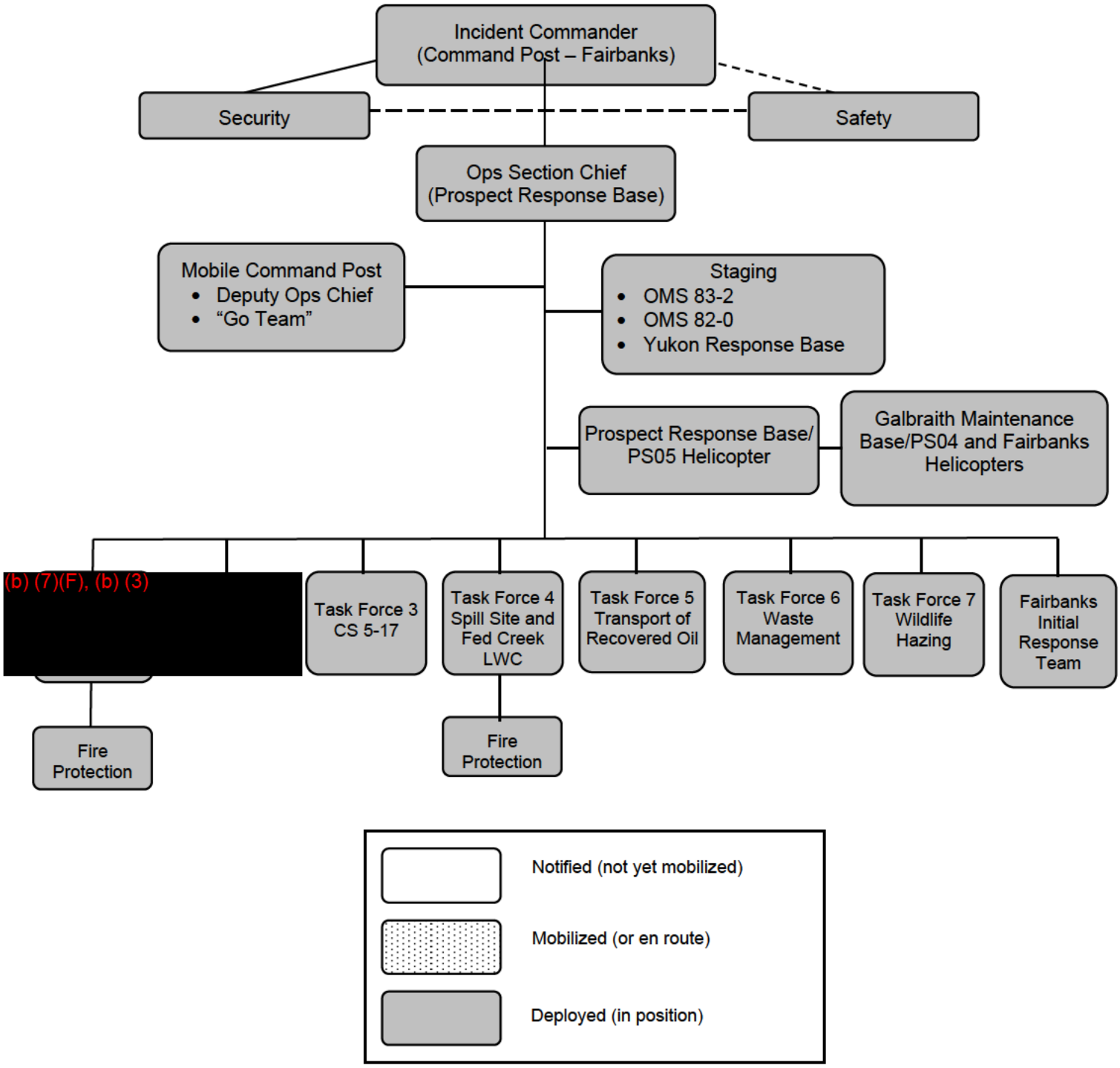


FIGURE FED.7
FED CREEK/NORTH FORK RAY RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 7-19

TABLE FED.3 FED CREEK/NORTH FORK RAY RIVER SCENARIO RESOURCE MOBILIZATION TABLE – FED CREEK (b) (7)(F), (b) (3)

CONTAIN AND RECOVER OIL AT FED CREEK (b) (7)(F), (b) (3)			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
3-person response crew plus 1 P&CM (TF-1)	(b) (7)(F), (b) (3)	Labor	T + 2 hr
Chain saws (2)		Brushing	T + 2 hr
Mega-Secur Dam		Dam Construction	T + 2 hr
26-foot summer response trailer		Response equipment	T + 2 hr
D-6 and D-3 dozers		Site access	T + 2 hr
Rollback		Transport of dozers	T + 2 hr
ARFF Fire Truck		Contingency	T + 3 hr
Fire fighters (2)		Contingency	T + 3 hr
Boom (2,000 feet)		Contain oil	T + 4 hr
Fire boom (196 feet)		Contingency	T + 4 hr
2- and 3-inch pumps and hoses		Recover oil	T + 4 hr
Helicopter (1)		Personnel and equipment transport	T + 3 hr
Aquaguard skimmer		Recover oil	T + 6 hr
Pedco 2-foot skimmer		Recover oil	T + 6 hr
Plywood (from lumber pallet)		Underlayment for portable storage	T + 4 hr
Portable storage (200,000 gallons)		Storage of recovered oil	T + 4-6 hr
Portable shelter		Shelter	T + 6 hr
5-person crew (baseline contractor) (night shift)		Labor	T + 7 hr
Portable Repeaters (3)		Communications support	T + 6 hr
10-person ACS crew		Labor	T + 18 hr
Note: Unless otherwise noted in text and tables, all e		Alyeska Pipeline Service Company (APSC).	

TABLE FED.4 FED CREEK/NORTH FORK RAY RIVER SCENARIO RESOURCE MOBILIZATION TABLE – [redacted]

CONTAIN AND RECOVER OIL AT PLMP 329 BRIDGE OVER NORTH FORK OF RAY RIVER			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
3-person response crew (TF-2)	Prospect Response Base	Labor	T + 1-2 hr
Mega-Secur Dam	Prospect Response Base	Dam Construction	T + 2 hr
Helicopter	Prospect Response Base	Initial Reconnaissance	T + 1 hr
45-foot response trailer	Prospect Response Base	Response equipment	T + 2 hr
6-person response crew (TF-2)	Stevens Village/Rampart	Labor	T + 5 hr
Portable storage (20,000 gal)	Prospect Response Base	Storage	T + 4 hr
2- and 3-inch pumps and hoses	Prospect Response Base	Recover oil	T + 4 hr
Pedco 2-foot skimmer	Prospect Response Base	Recover oil	T + 4 hr
Backhoe	Prospect Response Base	Dig containment pits	T + 4 hr
Aquaguard RBS-05 D2 skimmers (2)	Prospect Response Base	Oil recovery	T + 4 hr
Wash van	Fairbanks Response Base	Decontamination	T + 6 hr
Fire boom (196 feet)	Prospect Response Base	Contingency	T + 4 hr
Containment boom (2,000 feet)	Prospect Response Base	Containment	T + 4 hr
6-person crew (baseline contractor) (night shift)	Fairbanks Response Base	Labor	T + 7 hr
8-person SERVS crew	Valdez	Labor	T + 18 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE FED.5 FED CREEK/NORTH FORK RAY RIVER SCENARIO RESOURCE MOBILIZATION TABLE – CS5 -17

CONTAINMENT AND RECOVERY OPERATIONS			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
4-person response crew (TF-3)	Fairbanks Response Base	Labor	T + 5.5 hr
Mega-Secur Dam	Fairbanks Response Base	Dam Construction	T + 5.5 hr
Open top tanks (6,000 gal)	Fairbanks Response Base	Oil storage	T + 5.5 hr
2- and 3-inch pumps and hoses	Fairbanks Response Base	Recover oil	T + 5.5 hr
Pedco 2-foot skimmer	Yukon Response Base	Recover oil	T + 5.5 hr
Boom (2,000 feet)	Fairbanks Response Base	Containment	T + 5.5 hr
4-person response crew (baseline contractor) (night shift)	Fairbanks Response Base	Labor	T + 8 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE FED.6 FED CREEK/NORTH FORK RAY RIVER SCENARIO RESOURCE MOBILIZATION TABLE – SPILL SITE AND FED CREEK LWC

CONTAINMENT AND RECOVERY OPERATIONS			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
5-person response crew (TF-4)	Fairbanks Response Base	Labor	T + 6 hr
D-6 dozer	Prospect Response Base	Construct berm to block oil	T + 6 hr
Mega-Secur Dam	Fairbanks Response Base	Construct Dam	T + 6 hr
Decontamination Unit	Fairbanks Response Base	Decon	T + 6 hr
Open top tanks (6,000 gal)	Fairbanks Response Base	Oil storage	T + 6 hr
2- and 3-inch pumps and hoses	Fairbanks Response Base	Recover oil	T + 6 hr
5-person crew (baseline contractor) (night shift)	Fairbanks Response Base	Labor	T + 7 hr
Fire foam skid	Fairbanks Response Base	Contingency	T + 5 hr
Fire fighters (2)	Mutual Aid	Contingency	T + 5 hr
Pedco 2-foot skimmer	Fairbanks Response Base	Recover oil	T + 6 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE FED.7 FED CREEK/NORTH FORK RAY RIVER SCENARIO RESOURCE MOBILIZATION TABLE – TRANSPORT RECOVERED OIL

CONTAINMENT AND RECOVERY OPERATIONS			
Equipment/Personnel (Quantity)	**Location**	**Purpose**	**ETA**
100-bbl vac truck (3)	Prospect Response Base , Yukon Response Base , Fairbanks Response Base	Recover and transport oil	T + 4-6 hr
300-bbl vac truck (3)	North Slope- Mutual Aid	Recover and transport oil	T + 12 hr
Helicopter	Fairbanks Response Base	Operations Support	T + 3 hr
Portable SCR Pipeline	Fairbanks Response Base	Recovery	T + 12 hr
10,000-12,000-gal tanker truck (4)	Fairbanks Response Base	Transport recovered oil	T + 12 hr

Note: Unless otherwise noted in text and tables, all equipment and personnel are from APSC.

TABLE FED.8 FED CREEK/NORTH FORK RAY RIVER SCENARIO SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

The oil spill site is subdivided into the following areas: a) release point, b) Fed Creek, c) North Fork of Ray River, and d) banks of Fed Creek and North Fork of Ray River. This table provides a recap of oil held on land, contained along Fed Creek and North Fork of Ray River, and stranded along these creek banks. Estimated oil recovery rates include anticipated emulsified oil volumes for each area.

Due to the depth of oil trapped at the Mega-Secur Water Dams, initially oil is recovered using pumps and vac trucks at a rate (b) (7)(F), (b) (3) per hour (bph) at each containment site. As oil depth decreases, skimmers are used to recover oil (calculated at the derated skimmer capacity).

Note: Emulsification of the oil is expected to be minimal due to low water velocity and stream profile. Evaporation of up to 20 percent of the oil is likely to occur within the first 48 hours due to air and land temperatures but is not taken into account in the table below.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Oil Recovered (barrels)							
			4 hr	12 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)										

Scenario 8. Yukon River Winter

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from a 1-inch diameter bullet hole in an aboveground pipeline segment.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the spill location (Figures YUKW.1 and YUKW.2)
3. Timeline matrix (Table YUKW.1)
4. On-site resource tally sheet (Table YUKW.2)
5. Response organization charts (Figures YUKW.3 through YUKW.7)
6. Resource mobilization tables (Tables YUKW.3 through YUKW.5)
7. Summary of oil fate and estimated recovery table (Table YUKW.6)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures YUKW.1 and YUKW.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table YUKW.1). The timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table YUKW.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures YUKW.3 through YUKW.7). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables YUKW.3 through YUKW.5). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table YUKW.6).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

YUKON RIVER WINTER (b) (7)(F), l Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3)

Source

The leak occurs in a section of aboveground pipe at (b) (7)(F), (b) (3). The failure occurs due to a bullet hole (1-inch diameter) in the pipe at the midpoint on the bridge. The hole is located at the 6 o'clock position. Oil leaks at a rate of 600 pounds per square inch (psi) drainage from the pipeline for 1 hour and 38 psi for 28 hours for a total of (b) (7)(F),.

Environmental Conditions

Time	2000	**Wind**	20 knots, from E
Season	Winter – January 15	**Seas**	N/A
Snow/Ice Coverage	1½ feet of snow 18 inches of ice on the Yukon River	**Temperature**	-30ºF
Visibility	Blowing snow has reduced vis bility	**Tide/Current**	Yukon River covered in ice.

Environmental Considerations

The Yukon River is an anadromous fish stream and is considered critical habitat. Moose are widely distributed in this area. A concentrated nesting habitat for the peregrine falcon and other raptors is located along the Yukon River downstream of the Yukon River bridge. Activity in this area after April 15 is restricted.

Assumptions

1. Operations Control Center (OCC) shuts in the pipeline on January 15 at 2100 hours.
2. Oil leaks out of the hole for 1 hour at 600 psi and 28 hours at 38 psi. No repair can take place until completion of the Federal Bureau of Investigation (FBI) investigation.
3. FBI arrives the following day, investigation is completed at 1100 hours on January 16.
4. It takes twelve hours to remove pipeline insulation and install a pipeline clamp.
5. Removal of gross oil commences on January 18 and takes 11 days, using two shifts.

YUKON RIVER WINTER
(b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Sections 4.1.1, and 4.5.7	A D6 Cat and Tucker will be used to plow route across Yukon and construct a snow-berm containment. Bobcats will be used to haul oil off the ice and place in a temporary secondary containment.	Volume 2, Table YUKW.3
APSC Procedure ROW-SC-003	Source control will be by using special tools and installing the HC-320 48-inch hydraulic clamp.	Volume 2, Table YUKW.3

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table YUKW.1, Yukon River Winter Scenario Timeline Matrix).

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. OCC shuts in the pipeline and the remote gate valves (RGV) in Section 5 are closed. The closure time on RGV 60 is 8.5 minutes.
2. Security at the Yukon Response Base initiates a closure of the Yukon River Bridge. Security looks after closure on the south side of the bridge. Due to a potential explosion hazard on the bridge, Security contacts the Alaska Department of Transportation (DOT) camp at 7-Mile and requests that they close the bridge from the north side. Additionally, DOT is requested to notify Yukon Ventures on the north shore of the Yukon River and, as a precautionary measure, have the Yukon Ventures facility evacuated to the DOT camp at 7-Mile.
3. The Prospect Response Base RBS assumes the position of Initial Incident Commander and the Yukon Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the Prospect Response Base RBS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. The Yukon Response Base P&CM mobilizes the baseline contractor responders from PS05 to assist Yukon Response Base responders with initial response. The Safety Officer and Environmental Coordinator (EC) are mobilized from Prospect Response Base and Fairbanks Response Base, respectively. The Fairbanks Initial Response Team is also mobilized out of Fairbanks. Due to road conditions, travel speeds are reduced to 15 miles per hour. Estimated time of arrival (ETA) of assistance from Prospect Response Base is 5 hours and from Fairbanks is 9 hours.
4. Based on a preliminary assessment by Security, sabotage is suspected. The Alaska State Troopers are notified, who in turn notify the FBI. The FBI (out of Fairbanks) is mobilized to conduct an initial assessment of the site. Until this is completed, no repair activity can take place. ETA of the FBI is T + 10 hours. They take five hours to conduct their initial assessment and are completed at 1100 hours on January 16.
5. The Fairbanks Duty Officer calls out the IMT. The Pipeline Manager notifies senior management in Anchorage.
6. Based on the threat of sabotage, a complete reconnaissance of the pipeline is ordered. Priority is given to the area in the immediate vicinity of the Yukon River so that response and source control can be initiated. The reconnaissance for the Yukon River area is conducted by the off-duty security officer stationed at Yukon Response Base. This is completed by 2300 hours on January 15.
7. Safety and security measures are initiated.

YUKON RIVER WINTER
(b) (7)(F), (b) (3)

Oil Trajectory

Initially crude oil is spraying out of the 1-inch hole at 600 psi. Once the pipeline is shut in this is reduced to 38 psi. Due to the wind speed, the oil is being deposited on the snow/ice of the Yukon River up to a mile downstream of the pipeline bridge. Heaviest concentrations of oil are found immediately downstream of the bridge, reducing to a fine mist further away from the bridge. The oil is cooling as it falls through the air and accumulating on the snow. The oil is contained naturally by the snow. Total area to clean is 46 acres, or 2,000,000 square feet with a snow depth of 1½ feet.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"*, or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

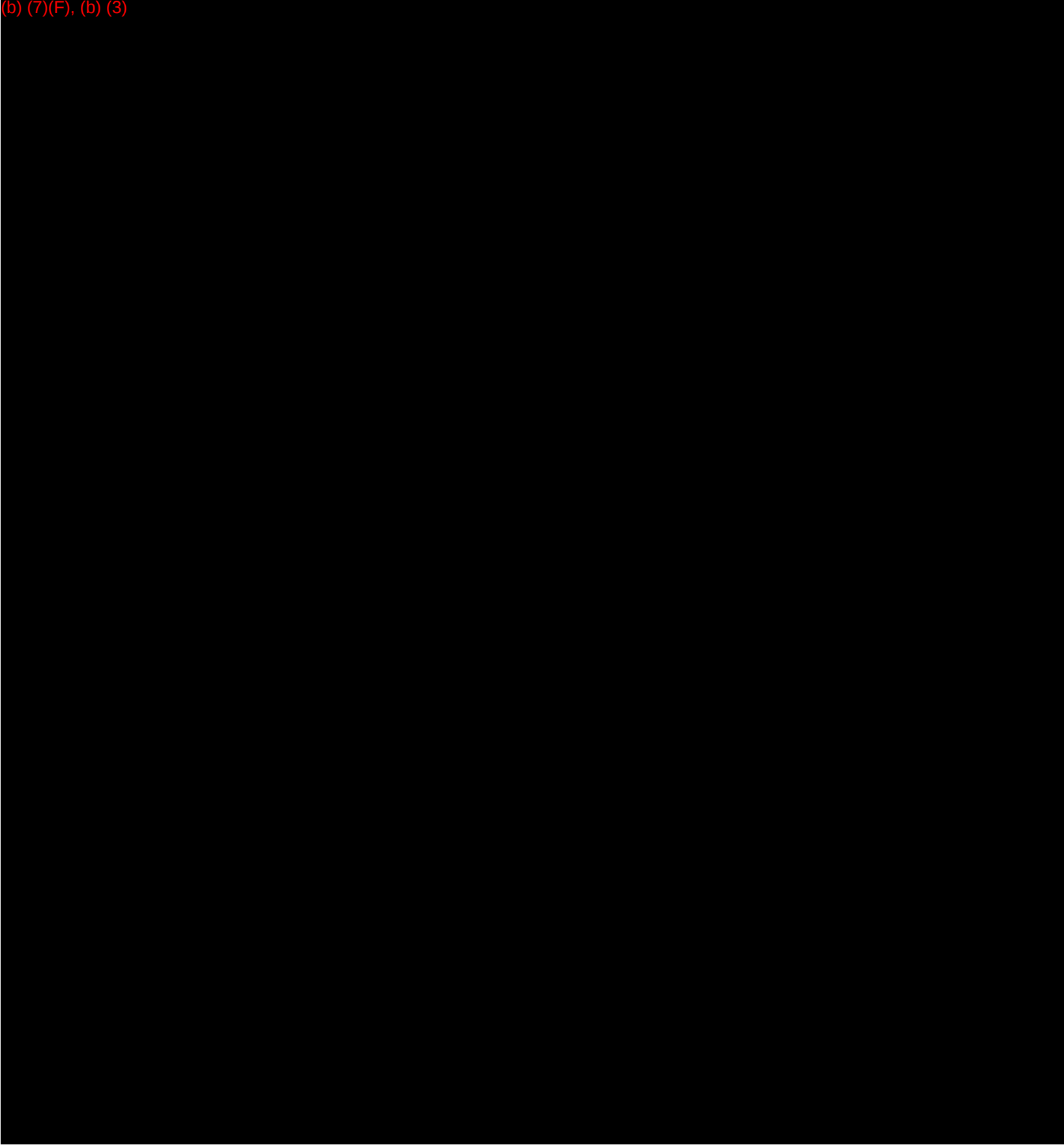


FIGURE YUKW.1
YUKON RIVER WINTER SCENARIO MAP

(b) (7)(F), (b) (3)

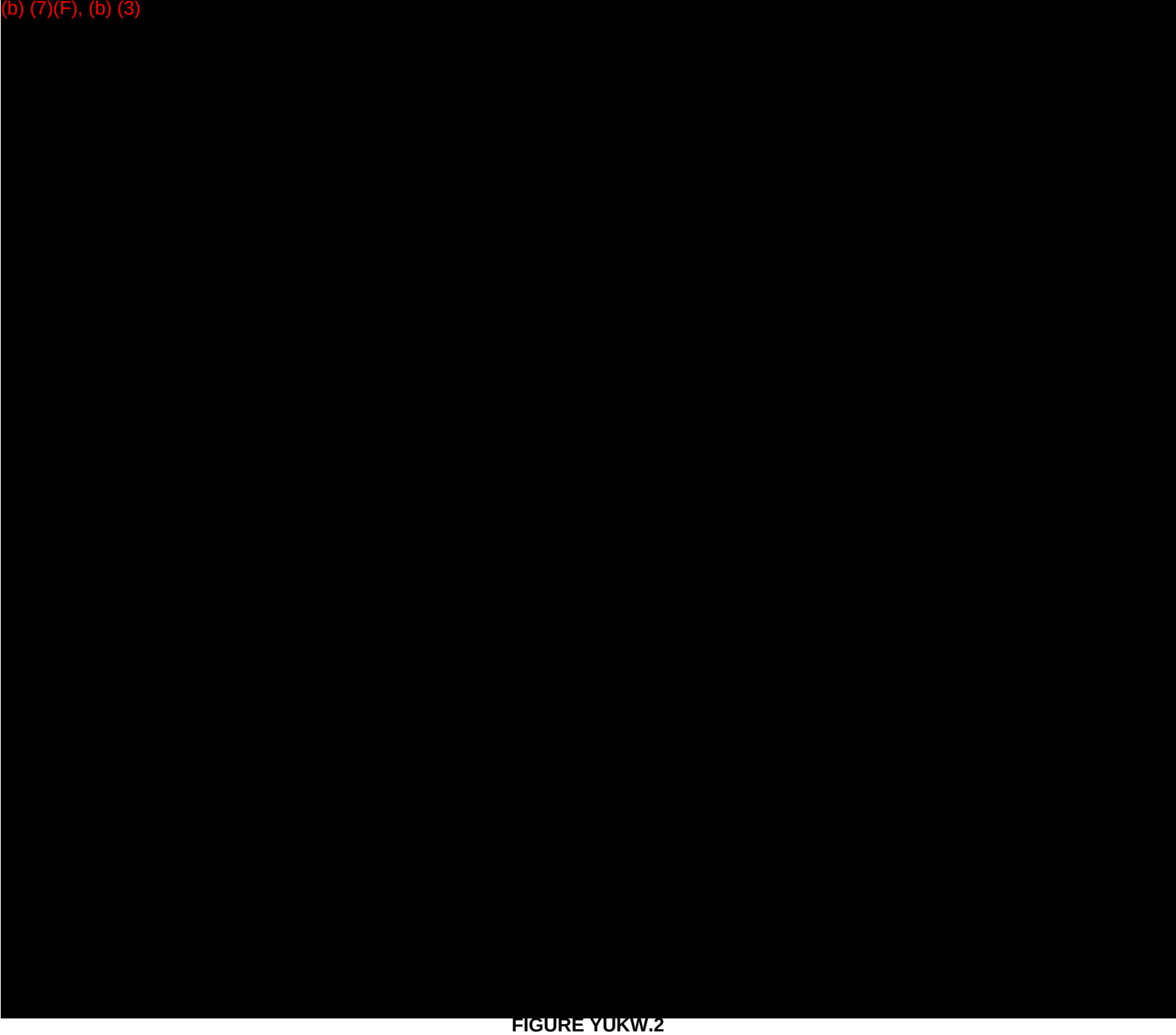


FIGURE YUKW.2
YUKON RIVER WINTER SCENARIO DEPLOYMENT MAP

TABLE YUKW.1 YUKON RIVER WINTER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-2 Day 1 (2000-2200) January 15	Hour 2-4 Day 1 (2200-2400) January 15	Hour 4-8 Day 2 (0000-0400) January 16	Hour 8-16 Day 2 (0400-1200) January 16	Hours 16-28 Day 2 (1200-2400) January 16
Situation/Status • **Weather** • **Environmental**	Winter season. Winds from E at 20 knots. Temperature -30ºF. Blowing snow has reduced vis bility.	Oil escapes from the pipeline at a pressure of 600 psi for the first hour and 38 psi for the following 28 hours. By the time the spill source is controlled, a total of 6,969 barrels is spilled.			
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site Security: safety, site control, surveillance.	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, and develop and implement leading edge tracking. Protect life safety. Preserve the crime scene.			
	Cleanup and countermeasures on land.	Investigate cause; stop source if safe. Contain on land if possible. Prepare to shut in the pipeline; redirect oil flow away from facilities. Establish access to the oiled ice area. Apply an HC-320 hydraulic clamp over the hole in the pipe.			
	Cleanup and countermeasures on water.	Deploy task forces and mobilize resources to maximize containment and recovery. Contain as near to pipeline as possible. Keep oil out of Yukon River. Restrict oil spread on Yukon River. Implement recovery operations.			
	Protection of sensitive resources and wildlife.	The Yukon River is an anadromous fish stream and is considered critical habitat. Moose are widely distributed in this area. Protect Peregrine Falcon and other raptors nesting habitat. Initiate ESA identification and prioritization process.			
	Agency and stakeholder notification	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	A fire fighting crew is mobilized from the North Slope (Mutual Aid) by aircraft to Prospect, where they mobilize the Prospect Response Base fire truck to the spill site. ETA is T + 24 hours. The primary mission of firefighters is personnel safety and protection. The Fairbanks Initial Response Team mobilizes a fire foam skid with the pipeline repair equipment for contingency at the spill site. The first responder to arrive on site (TF-1 at T + 1 hours) brings air monitoring equipment and completes an initial site safety assessment. The information is radioed to the Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site.	Security: OCC shuts in pipeline and the remote gate valves (RGV) in Section 5 are closed. The closure time on RGV 60 is 8.5 minutes. Security at Yukon Response Base initiates a closure of the Yukon River Bridge. Security looks after closure on the south side of the bridge. Due to a potential explosion hazard on the bridge. Security contacts the State DOT camp at 7-Mile and requests that they close the bridge from the north side. Additionally, DOT is requested to notify Yukon Ventures on the north shore of the Yukon River and, as a precautionary measure, have the Yukon Ventures facility evacuated to the DOT camp at 7-Mile. All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is > 20%, additional fire and safety precautions are initiated to eliminate ignition sources. Incipient level fire suppression equipment is provided on site. This may include a fire truck(s), fire foam skid(s), wheeled 150-pound extinguishers, and hand-held extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires utilizing high volume handlines. Based on the threat of sabotage, a complete reconnaissance of the pipeline is ordered. Priority is given to the area in the immediate vicinity of the Yukon River so that response and source control can be initiated. The reconnaissance for the Yukon River area is conducted by the off-duty security officer stationed at Yukon Response Base. This is completed by 2300 hours on January 15.	Safety: Safety specialist from Prospect Response Base arrives on site. The safety specialist conducts a site safety analysis utilizing the "Site Safety and Control Analysis" (Form ICS 201-5). Potential hazards, personal protective equipment requirements, establishment of decontamination, and the ability to move safely on the ice are identified.		The fire foam skid arrives with the Fairbanks Initial Response Team at T + 16 hours. The Mutual Aid firefighters arrive on-site with the Prospect Response Base fire truck at T + 24 hours.

TABLE YUKW.1 (CONTINUED) YUKON RIVER WINTER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-2 Day 1 (2000-2200) January 15	Hour 2-4 Day 1 (2200-2400) January 15	Hour 4-8 Day 2 (0000-0400) January 16	Hour 8-16 Day 2 (0400-1200) January 16	Hours 16-28 Day 2 (1200-2400) January 16
Discharge Tracking	The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by air, on the ground, or both. Aerial tracking is done visually by helicopter. The Prospect Response Base/PS05 helicopter is put on standby for aerial tracking if weather allows.	On the ground, tracking is done by containment and recovery operations personnel who establish the extent of spread of the spilled oil. In the initial response, tracking reports are made to the incident command center via radio on an hourly basis at least. Incident Commander tracks discharge on a situation status map. Incident Command Staff formulate or adjust incident objectives, define strategies, and prioritize actions.		As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.	
Protection of Environmentally Sensitive Areas (ESAs)	The Yukon River is an anadromous fish stream and is considered critical habitat. Moose are widely distributed in this area. A concentrated nesting habitat for the Peregrine Falcon and other raptors is located along the Yukon River downstream of the Yukon River Bridge. Activity in this area after April 15 is restricted.				
Response Actions	Trucker notifies Yukon Response Base security of strong crude smell on the bridge. Yukon Response Base Security notifies the Yukon Response Base P&CM and the OCC who initiates a pipeline shut-in. OCC notifies the Pipeline Manager, Fairbanks and Anchorage Duty Officers. The Prospect Response Base RBS assumes the position of Initial Incident Commander and the Yukon Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the Prospect Response Base RBS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. The baseline contractor responders from Prospect Response Base are mobilized to assist the Yukon Response Base responders with initial response. The Safety Officer and ECs are mobilized from Prospect Response Base and Fairbanks Response Base, respectively. The Fairbanks Initial Response Team is also mobilized out of Fairbanks. Due to road conditions, travel speeds are reduced to 15 miles per hour. ETA of assistance from PS05 is 5 hours and from Fairbanks is 9 hours.	OCC: Federal and State agencies are notified (ADEC, NRC, BLM, and ADNR). Based on a preliminary assessment by Security, sabotage is suspected. The Alaska State Troopers are notified, who in turn notify the FBI. The FBI (out of Fairbanks) is mobilized to conduct an initial assessment of the site. Containment and recovery task force personnel submit tracking reports to the Incident Command Center via radio on an hourly basis.	The Safety Officer and responders from Prospect Response Base arrive on site at T + 6 hours.		
Communications	Aerial observations are reported to the Incident Command Center via radio on an hourly basis at least. Because of the close proximity of response resources, radio communications can be accommodated by handheld and vehicle radios. A Communications Plan that incorporates spill response action, law enforcement actions, and pipeline repair/source control actions is developed and implemented with the first and subsequent Incident Action Plan(s).				

TABLE YUKW.1 (CONTINUED) YUKON RIVER WINTER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-2 Day 1 (2000-2200) January 15	Hour 2-4 Day 1 (2200-2400) January 15	Hour 4-8 Day 2 (0000-0400) January 16	Hour 8-16 Day 2 (0400-1200) January 16	Hours 16-28 Day 2 (1200-2400) January 16
Task Force 1 **Trail Plowing and Containment**	Responders are mobilized from Prospect Response Base and Yukon Response Base with equipment shown in Table YUKW.4. Yukon Response Base responders arrive on site at T + 1 hours and complete an initial site safety assessment as descr bed above.	Begin plowing out the old trail to the hovercraft base on the south shore of the Yukon River. This provides access for light vehicles and personnel to move back and forth across the river. Snow berms are constructed to contain the spilled oil.	The Prospect Response Base responders arrive on location at T + 6 hours. A Tucker from Yukon Response Base is used to carry passengers and equipment across the ice.	The trail plowing is completed by 0800.	No night shift is needed for this task force.
Task Force 2 **Pipeline Repair** **(Source Control)**		The Fairbanks Initial Response Team mobilizes, with Fairbanks Response Base equipment shown in Table YUKW.3, and transits to the Yukon Response Base where they standby until the FBI have completed their initial assessment. The Mobile Command Post and "Go Team" arrive and provide support services.		FBI arrives on-site at 0600 hours. The FBI takes five hours to conduct their initial assessment and are completed at T + 15 hours (1100) hours on Jan. 16. The Fairbanks Initial Response Team arrives at PS06 pad at T + 12 hour, where they standby until the FBI has completed their initial assessment. They mobilize the additional equipment (compressor and fork lift) from Yukon Response Base when they mobilize to the site.	The Fairbanks Initial Response Team begins the pipeline repair at T + 16 hours. Twelve hours is required to remove pipeline insulation and install the HC-320 hydraulic pipeline clamp. This is completed at T + 28 (0000 hours on January 17).
Task Force 3 **Containment** **Task Force 4** **Recovery**	Containment and recovery crews are mobilized from baseline contractor Fairbanks Response Base (through the response action contract) and Stevens and Rampart Villages (70). ETA is T + 28 hours.			The responders stay in local housing (TBD) on January 16. The remainder of personnel for the response are temporarily billeted at the Livengood Camp, located 53 miles south of PS06. Alyeska immediately makes arrangements to bring in a 100-man camp and place it at PS06 pad.	Bobcats begin arriving at T + 24 hours and continue arriving throughout the day on January 17. Dumpsters and open top containers are mobilized from Fairbanks Response Base for hauling recovered oil/snow to shore. The containment and recovery crews from Fairbanks Response Base, Stevens Village, and Rampart arrive on-site at T + 28 hours.
Wildlife Protection – Rehabilitation	The EC is mobilized from Fairbanks Response Base.	The Environment Unit places CCI on standby to provide wildlife hazers and to mobilize the wildlife treatment center from Fairbanks if necessary.		The EC arrives on site. The EC determines that the risk of wildlife entering the spill site is neglig ble and recommends that no wildlife hazers be mobilized to the site.	

TABLE YUKW.1 (CONTINUED) YUKON RIVER WINTER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day 3 – 15 January 17 - 29
Response Actions	The On-Scene Incident Commander, the Federal On-Scene Coordinator, and the State On-Scene Coordinator continuously monitor the response organization's performance in achieving the incident objectives. Cold temperatures may affect operational efficiencies and adjustments to numbers of responders and reserve equipment may be needed. Response activities require close coordination with law enforcement agencies to minimize conflicts between the crime investigation and response activities.
Task Force 3 **Containment**	Four days are required to dismantle the 100-man camp, move it to PS06 pad, and put it back together. The camp is on-line and operational by the evening of January 19. A containment area for oiled snow is constructed adjacent to the staging area. It is constructed using the D-6 Cat and has dimensions of 300 feet x 300 feet x 8 feet. A commercial vendor in Fairbanks is requested to pre-fabricate a liner and deliver it to the location. Construction of the containment area is completed by mid-afternoon on January 17.
Task Force 4 **Oil Recovery**	Oil is removed from the ice with the use of heavy equipment. Removal of gross oil commences on January 18 and takes 11 days, using two shifts. This is based on a total area to clean of 46 acres or 2,000,000 square feet and a snow depth of 1½ feet. Approximately 1,000,000 cubic feet of snow and oil need to be removed. Approximately 95,000 cubic feet of snow is removed per day. Baseline contractor crews of laborers remain for a longer term to conduct polishing and removal of any remaining contaminated snow/oil by hand. Oiled snow removed from the ice is stockpiled in the temporary containment area. Stockpiled oily snow is fed to the Lister Snowmelter. Recovered oil is skimmed off the surface of the melter and is hauled to PS06, where piping is flanged up to reinject the recovered oil into the pipeline. An oil/water separator system is brought to the location and the meltwater is processed through the separator.
Storage and Disposal	A permit is obtained from the ADEC for discharge of the treated water to uplands areas, as long as there is no visible sheen and the total petroleum hydrocarbon concentration is at or below 15 mg/l. Solid waste is segregated in clear bags: 1. Waste to landfill 2. Non-hazardous waste 3. Heavily oiled waste (hazardous)

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations of resources and other organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE YUKW.2 YUKON RIVER WINTER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-2 2000-2200, January 15								Hour 2-4 2200-2400							Hour 4-8 2400-0400, January 16						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	--	--	--	--	--	--	2	--	--	--	--	--	--	2	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--	1 helicopter (1)	--	--	--	--	--	--	1 helicopter (1)[4]	--	--	--	--		--	1 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--		--	--	--	--
Safety	Site Safety and Control[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--
Response	Trail Plowing	TF-1 Trail Plowing	3	3	--	--	--	--	--	--	3	1 D6 Cat (1)[8] 1 tucker (1)[8]	--	--	--	--	--	8	1 D6 cat (1)[8] 1 tucker (1)[8]	--	--	--	--	--
Source Control	Pipeline Clamp Installation	TF-2 Pipeline Repair	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--		--	--	--	--	--
Response	Containment	TF-3 Containment	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Response	Recovery	TF-4 Oil Recovery	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--	Mobile Command Post (12)	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			Note[7]	5	0	13					5	2	1					3	2	1				
Mechanical Equipment Total					0	2						3	1						2	1				

TABLE YUKW.2 (CONTINUED) YUKON RIVER WINTER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 8-16 0400-1200, January 16								Hour 16-24 1200-2000							Hour 24+ 2000+						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	--	--	--	--	--	--	2	--	--	--	--	--	--	2	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--	1 helicopter (1)[4]	--	--	--	--		--	1 helicopter (1)[4]	--	--	--	--	--	--	1 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--		--	--	--	--		--	Fire foam skid (1)	--	--	--	--	--	--	1 Prospect Response Base fire truck (2)	--	--	--	
Safety	Site Safety and Control[6]	-	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Response	Trail Plowing	TF-1 Trail Plowing	8	8	1 D6 cat (1)[8] 1 tucker (1)[8]		--	--	--	--	8	1 D6 cat (1)[8] 1 tucker (1)[8]	--	--	--	--	--	8	D7 cat (1)[8] 1 Yukon Response Base tucker (1)[8]	--	--	--	--	--
Source Control	Pipeline Clamp Installation	TF-2 Pipeline Repair	--	--		--	--	--	--	--	12	1 185 CFM air compressor 1 fork lift (1)[8] Crane (1)[8]	1 ea. 48-in by 22.5-in HC-320 hydraulic clamp 1.5-in impact gun 1 rigging PKG 1-in female to 1.5-in male adaptor 1-in torque wrench 1-in drive multiplier 1.5-in drive multiplier $3^{7}/_{8}$-in knocker wrench 1 box half-round bastard files $3^{7}/_{8}$-in shaved socket 1.5-in drive	--	--	--	--	12	1 Yukon Response Base 185 CFM air compressor 1 Yukon Response Base fork lift (1)[8] Crane (1)[8]	1ea. 48-in by 22.5-in HC-320 hydraulic clamp 1.5-in impact gun 1 rigging PKG 1-in female to 1.5-in male adaptor 1-in torque wrench 1-in drive multiplier 1.5-in drive multiplier $3^{7}/_{8}$-inch knocker wrench 1 box half-round bastard files $3^{7}/_{8}$-inch shaved socket 1.5-inch drive	--	--	--	--
Response	Containment	TF-3 Containment	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	40	20 bobcats (30) Snowmelter (1) D6 Cat (1)	20 ea. 12-ft aluminum containers 320-ft x 320-ft liner --	--	--	--	--
	Oil Recovery	TF-4 Oil Recovery	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	shared with TF-3	shared with TF-3	shared with TF-3	--	--	1	(b) (7)

TABLE YUKW.2 (CONTINUED) YUKON RIVER WINTER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 8-16 0400-1200, January 16								Hour 16-24 1200-2000							Hour 24+ 2000+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
On-Scene Comms.	Communications Support	Comms.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			Note[7]	11	2	1					23	4	2					66	34	3				
Mechanical Equipment Total					2	2						5	2						36	3				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

– Not arrived on site. May be mobilized or en route.

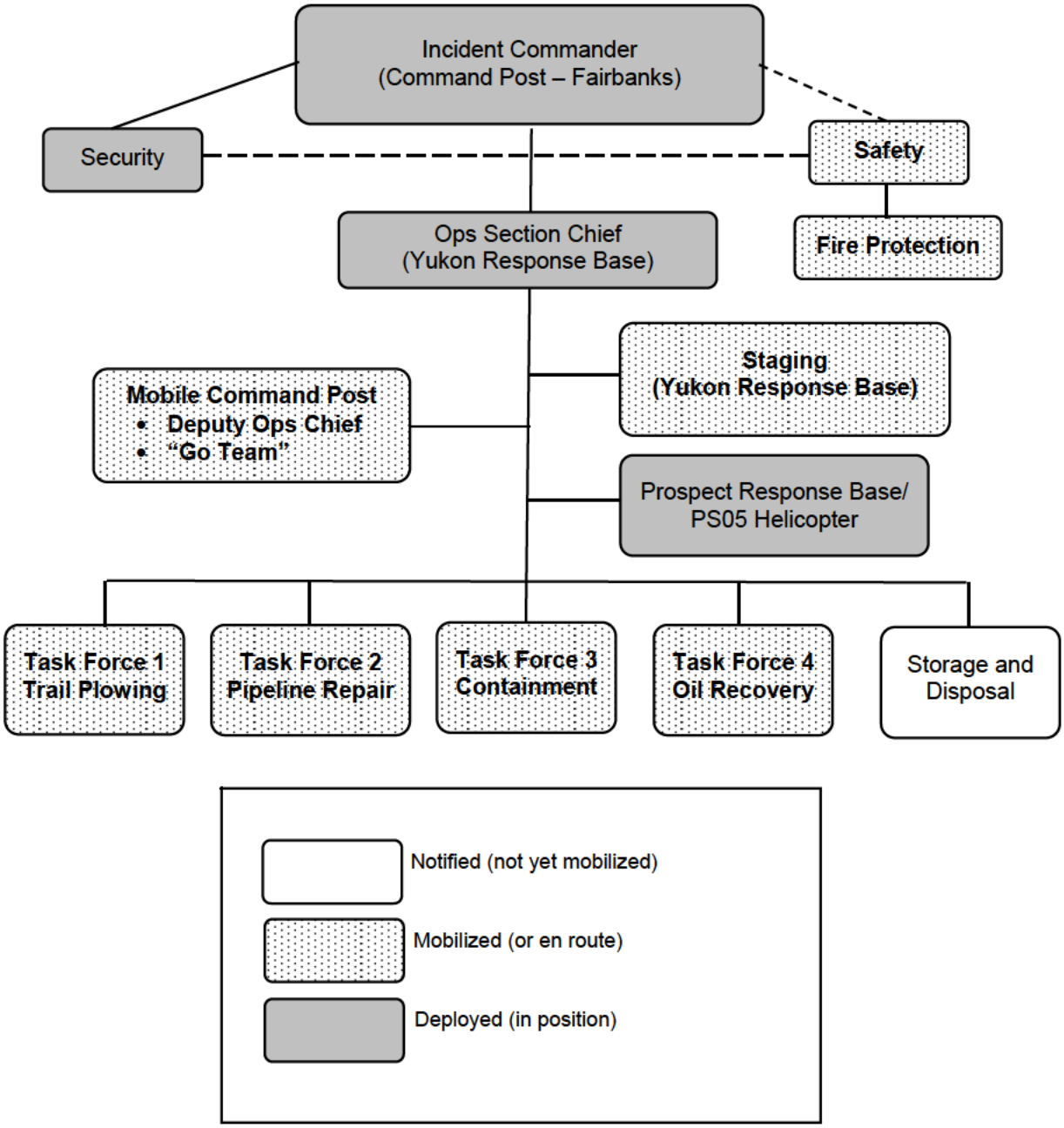


FIGURE YUKW.3
YUKON RIVER WINTER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-2

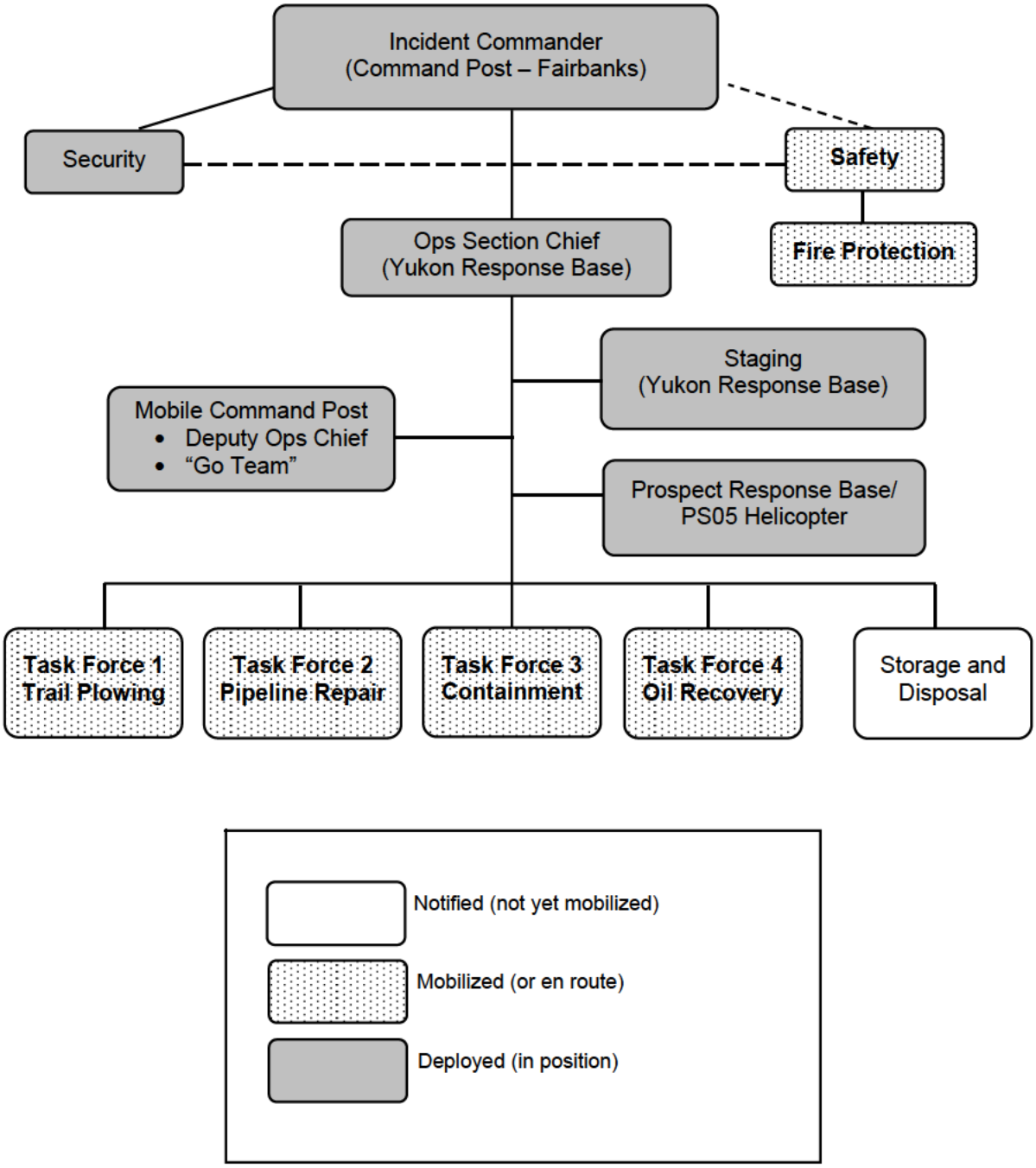


FIGURE YUKW.4
YUKON RIVER WINTER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 2-4

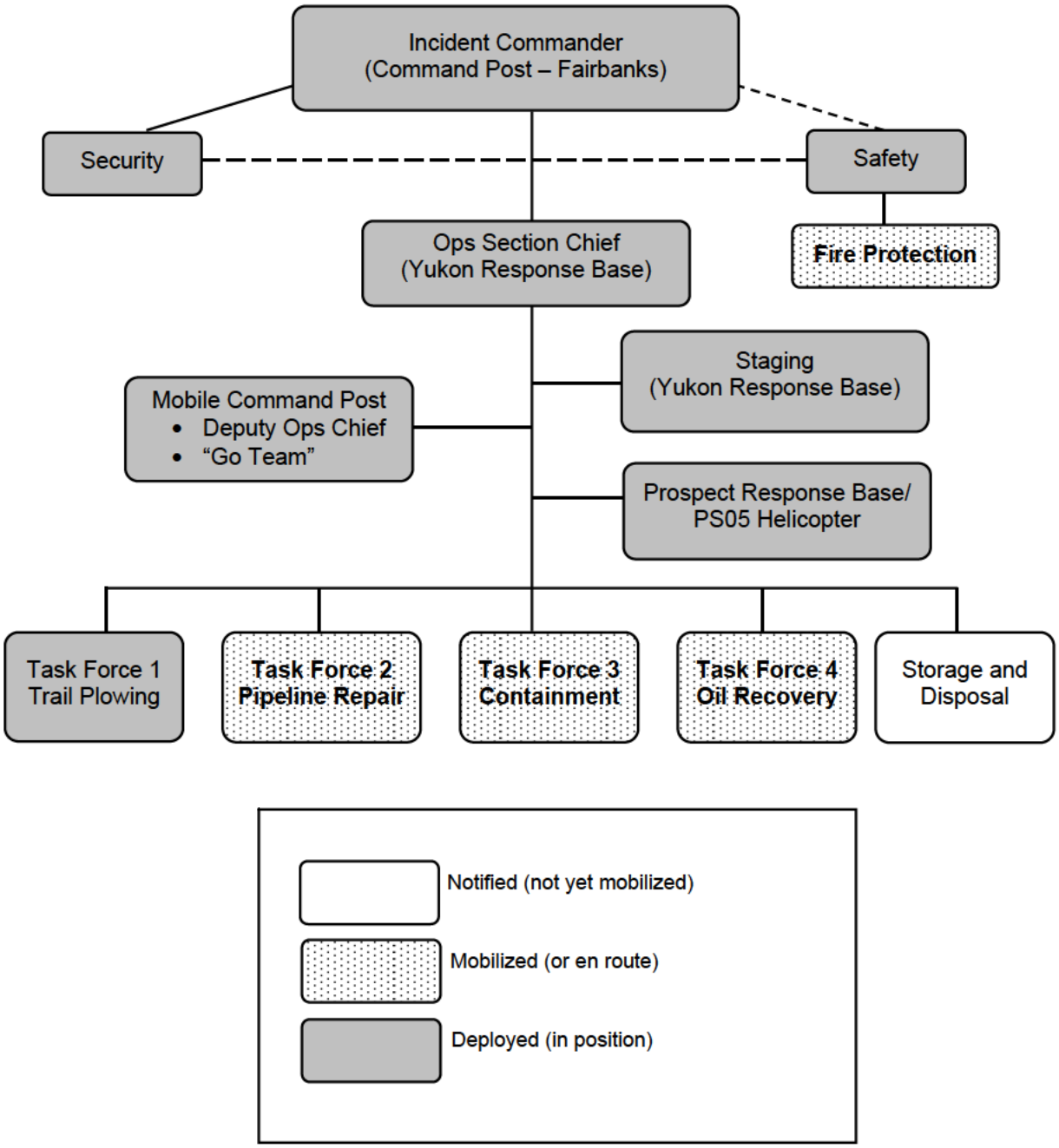


FIGURE YUKW.5
YUKON RIVER WINTER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 4-8

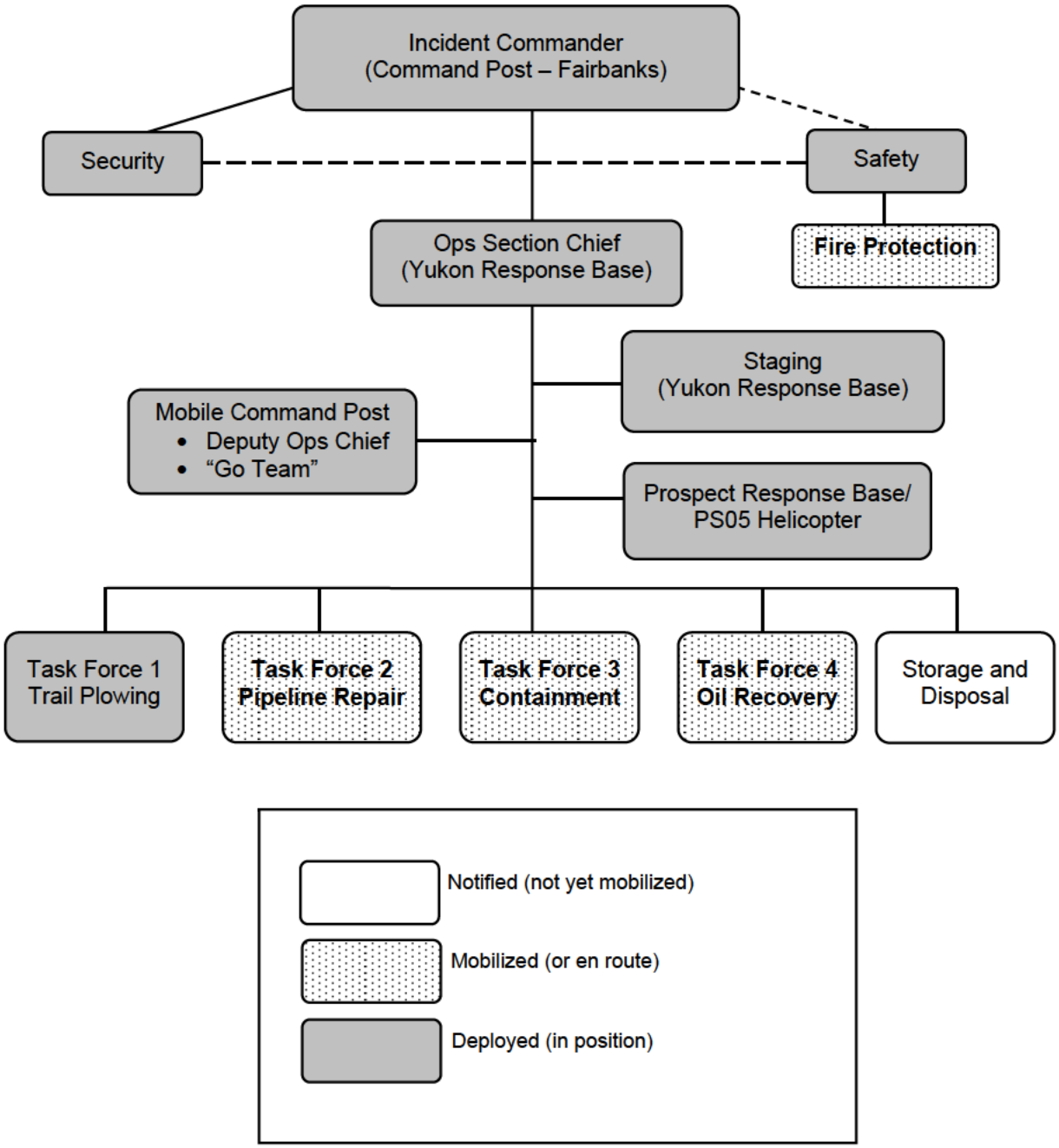


FIGURE YUKW.6
YUKON RIVER WINTER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 8-16

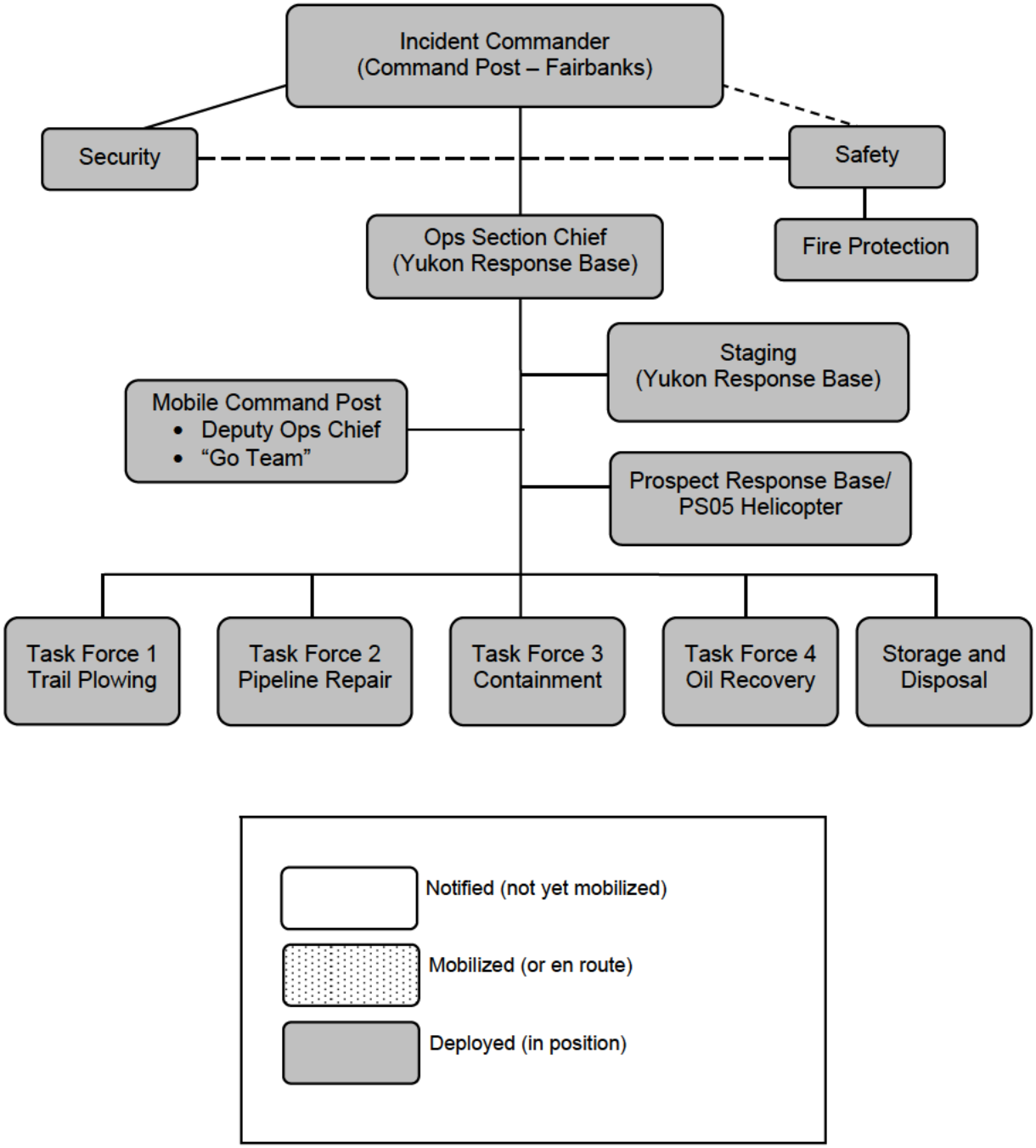


FIGURE YUKW.7
YUKON RIVER WINTER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 16+

TABLE YUKW.3 YUKON RIVER WINTER SCENARIO
EQUIPMENT AND MANPOWER MOBILIZATION FOR SOURCE CONTROL AT YUKON RIVER

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
48-inch x 22½-inch HC-320 hydraulic clamp	Fairbanks Response Base	Stopping leak and allowing pipeline to return to operation	T + 16 hr
Crane (18 ton)	Fairbanks Response Base	Installation of the clamp	T + 16 hr
Fork Lift	Yukon Response Base	Moving materials	T + 16 hr
185 CFM air compressor	Yukon Response Base	Operations of air driven wrenches	T + 16 hr
1½-inch impact gun (1)	Fairbanks Response Base	Tightening bolts	T + 16 hr
Rigging package (1)	Fairbanks Response Base	Slinging the clamp	T + 16 hr
1 each 1-inch female to 1½-inch male adaptor	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
1-inch drive torque wrench (1)	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
1-inch drive multiplier (1)	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
1½-inch drive multiplier (1)	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
$3^{7}/_{8}$-inch Knocker wrench (1)	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
Box of half-round bastard files (1)	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
1 each $3^{7}/_{8}$-inch shaved socket 1½-inch drive	Fairbanks Response Base	Special tools for clamp installation	T + 16 hr
Welder (1) TF-2 Fitters (3) TF-2 Operator (1) TF-2 Laborer (1) TF-2	Fairbanks Response Base	Site fabrication, preparation and installation	T + 16 hr
Initial Response Team (6) TF-2	Fairbanks Response Base	Pipeline Repair	T + 16
Fire Foam Skid	Fairbanks Response Base	Contingency	T + 16 hr
Fire Truck	Prospect Response Base	Contingency	T + 24 hr
Fire Fighters	Mutual Aid (North Slope)	Contingency	T + 24 hr

TABLE YUKW.4 YUKON RIVER WINTER SCENARIO EQUIPMENT AND MANPOWER MOBILIZATION FOR PLOWING OUT ROUTE ACROSS YUKON RIVER

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
PS05 Responders – TF-1 (5)	Prospect Response Base	Labor	T + 6 hr
Yukon Response Base Responders – TF-1 (3)	Yukon Response Base	Labor	T + 1 hr
D6 Cat (operator included in crew of 3 – TF-1)	Yukon Response Base	Plowing out access road to Yukon River. Make snow berms.	T + 2 hr
Low Boy Trailer and Semi	Yukon Response Base	Equipment Transportation	T + 2 hr
Tucker (operator included in crew of 3 – TF-1)	Yukon Response Base	Transporting personnel and equipment across the river	T + 2 hr

TABLE YUKW.5 YUKON RIVER WINTER SCENARIO EQUIPMENT AND MANPOWER MOBILIZATION FOR OIL CONTAINMENT AND RECOVERY AT YUKON RIVER

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
3-person survey crew	Ocean-Tech-Fairbanks Response Base	Delineate aerial coverage	T + 28 hr
12-foot aluminum containers (20)	Available commercially through Alaska West Fairbanks	Hauling snow off of the ice	T + 24-48 hr
Bobcats (20)	Commercial suppliers – Fairbanks (20)	Picking up oil off ice and transporting containers to shore	T + 24-48 hr
Operators – TF-3 (30)	Baseline contractor Fairbanks, Stevens and Rampart Villages	Operate Bobcats	T + 24-48 hr
Laborers – TF-3 (40)	Baseline contractor Fairbanks, Stevens and Rampart Villages	Cleanup behind Bobcats	T + 24-48 hr
320-foot by 320-foot liner (1)	Commercial supplier – Fairbanks	Liner	Day 3+
D6 Cat (shared with TF-1)	Yukon Response Base	Construct secondary containment	On-site
Lister Snowmelter and two operators	Fairbanks Nordale Yard	Volume reduction and oil/water separation	Day 3+

TABLE YUKW.6 YUKON RIVER WINTER SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil retained and recovered by various methods is summarized in Table YUKW.6. All of the discharged oil is retained in the snow pack on the frozen Yukon River. The gross contaminated snow is removed by heavy equipment starting on January 18 (approximately T + 60 hr) and finishing 11 days later. The final polish work is done by hand after the heavy equipment work is completed.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Cumulative Oil Recovered (bbl)							
			4 hr	12 hr	24 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)										

Scenario 9. Yukon River Summer

10,000-Barrel Spill on Land to Water

This scenario depicts representative oil spill response activities for an oil spill from a ½-inch diameter bullet hole in an aboveground pipeline segment.

The scenario is described by seven components:

1. Introductory text
2. A two-page scenario map (Figures YUKS.1 and YUKS.2) and a deployment map (Figure YUKS.3) depicting the site location
3. Timeline matrix (Table YUKS.1)
4. On-site resource tally sheet (Table YUKS.2)
5. Response organization charts (Figures YUKS.4 through YUKS.8)
6. Resource mobilization tables (Tables YUKS.3 through YUKS.7)
7. Summary of oil fate and estimated recovery table (Table YUKS.8)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a two-page scenario map depicting the site location (Figures YUKS.1 and YUKS.2) and a deployment map that shows containment site, task force, and staging area locations (Figure YUKS.3). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table YUKS.1). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table YUKS.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figure YUKS.4 through Figure YUKS.8). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables YUKS.3 through YUKS.7). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table YUKS.8).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

YUKON RIVER SUMMER 10,000-Barrel Spill on Land to Water	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	10,000 barrels (bbl) – crude oil

Source

The leak occurs in a section of aboveground pipe a[redacted]. The failure occurs due to a bullet hole (½-inch diameter). Drainage from the pipeline is at 600 pounds per square inch (psi) initially and 86 psi once the pipeline is shut in resulting in a total release of 10,000 barrels.

Environmental Conditions

Time	1000 hours	**Wind**	10 mph, from NE
Season	Summer – June	**Water level**	Low
Snow/Ice Coverage	None	**Temperature**	70ºF
Visibility	No precipitation	**Tide/Current**	Burbot Creek: 0.25 feet per second (fps) Yukon River: 3-6 fps

Environmental Considerations

The Yukon River is an anadromous fish stream and is considered critical habitat. Moose are widely distributed in this area. A concentrated nesting habitat for the peregrine falcon and other raptors is located along the Yukon River downstream of the Yukon River Bridge. Activity in this area after April 15 is restricted.

Assumptions

Oil has been leaking for two days prior to shutdown of the pipeline. Yukon Response Base P&CM discovers the leak during the weekly surveillance flight in the Prospect Response Base/PS05 helicopter.

1. Oil has formed a pooled area just north of Burbot Creek and is nearing the Yukon River.
2. The Federal Bureau of Investigation (FBI) arrives at T + 3 hours and completes their initial investigation by the time the Fairbanks Initial Response Team arrives to repair the pipeline.
3. An HC-320 hydraulic clamp is installed at T + 10 hours.

YUKON RIVER SUMMER
(b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Sections 4.1.1	Minimize the volume of oil entering the Yukon River by constructing underflow dam and using skimmers, temporary tanks and vacuum trucks to recover spilled oil.	Volume 2, Table YUKS.3
Volume 3, Section 4.1.1 and 4.3.3	Use culvert blocking to oil at spill site. Recover spilled oil by using a skimmer, portable oil storage tank and a vacuum truck.	Volume 2, Table YUKS.5
APSC Procedure ROW-SC-003	Source control will be by using special tools and installing the HC-320 48-inch hydraulic clamp.	Volume 2, Table YUKS.7
Volume 3, Section 4.1.1	Mobilize equipment to CS6-2 Crescent island by river boat and establish containment booming and fast tanks for storage.	Volume 2, Table YUKS.6

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table YUKS.1, Yukon River Summer Scenario Timeline Matrix.)

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. Operations control center (OCC) shuts in the pipeline and the remote gate valves (RGV) in Section 5 are closed.
2. The Prospect Response Base RBS assumes the position of Initial Incident Commander and the Yukon Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the Prospect Response Base RBS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. Safety and security measures are initiated.
3. The Ops Section Chief mobilizes the following resources:
    - Three Yukon Response Base responders to the confluence of Burbot Creek and the Yukon Response Base (CS5-26) (TF-1)
    - Two Prospect Response Base responders to mobilize equipment to the Yukon boat launch (TF-2), and the Stevens Village crew (5 responders) to join TF-2 at the boat launch and then set up containment on the Yukon at the mouth of the Ray River.
    - Four Prospect Response Base responders to Burbot Creek at (b) (7)(F), (b) (3)
    - An off-duty P&CM from Fairbanks Response Base and the Rampart crew (8 responders) to Crescent Island (CS6-2) (TF-4)
    - The Fairbanks Initial Response Team (6-person crew) to repair the pipeline (TF-5)
4. The Alaska State Troopers are notified of the sabotage event and they in turn notify the FBI. The FBI (out of Fairbanks) are mobilized to conduct an initial assessment of the site. They are flown to the scene via helicopter along with an Alyeska Oil Spill Coordinator (OC) and an off-duty P&CM from Fairbanks. They arrive at 1300 hours (T + 3 hours). The FBI takes 3 hours to conduct their initial assessment and are completed at 1600 hours.
5. Baseline contractor is requested to mobilize a night shift of 25 people (composed of off-duty personnel) to report to the staging area at the Yukon Response Base at 1900 hours.

YUKON RIVER SUMMER
(b) (7)(F), (b) (3)

Oil Trajectory

Oil has been leaking for approximately two days. Oil has formed a pooled area just north of Burbot Creek, run down the creek through the culvert in the haul road, and is nearing the Yukon River. Initially, crude oil is spraying out of the ½-inch hole in the pipeline at 600 psi. Once the pipeline is shut in, this is reduced to 86 psi over a several hour period.

Oil flows down Burbot Creek and into the Yukon River. The flow rates from the Ray River and Woodchopper Creek into the Yukon are high enough to prevent oil from flowing into these two tributaries.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"*, or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

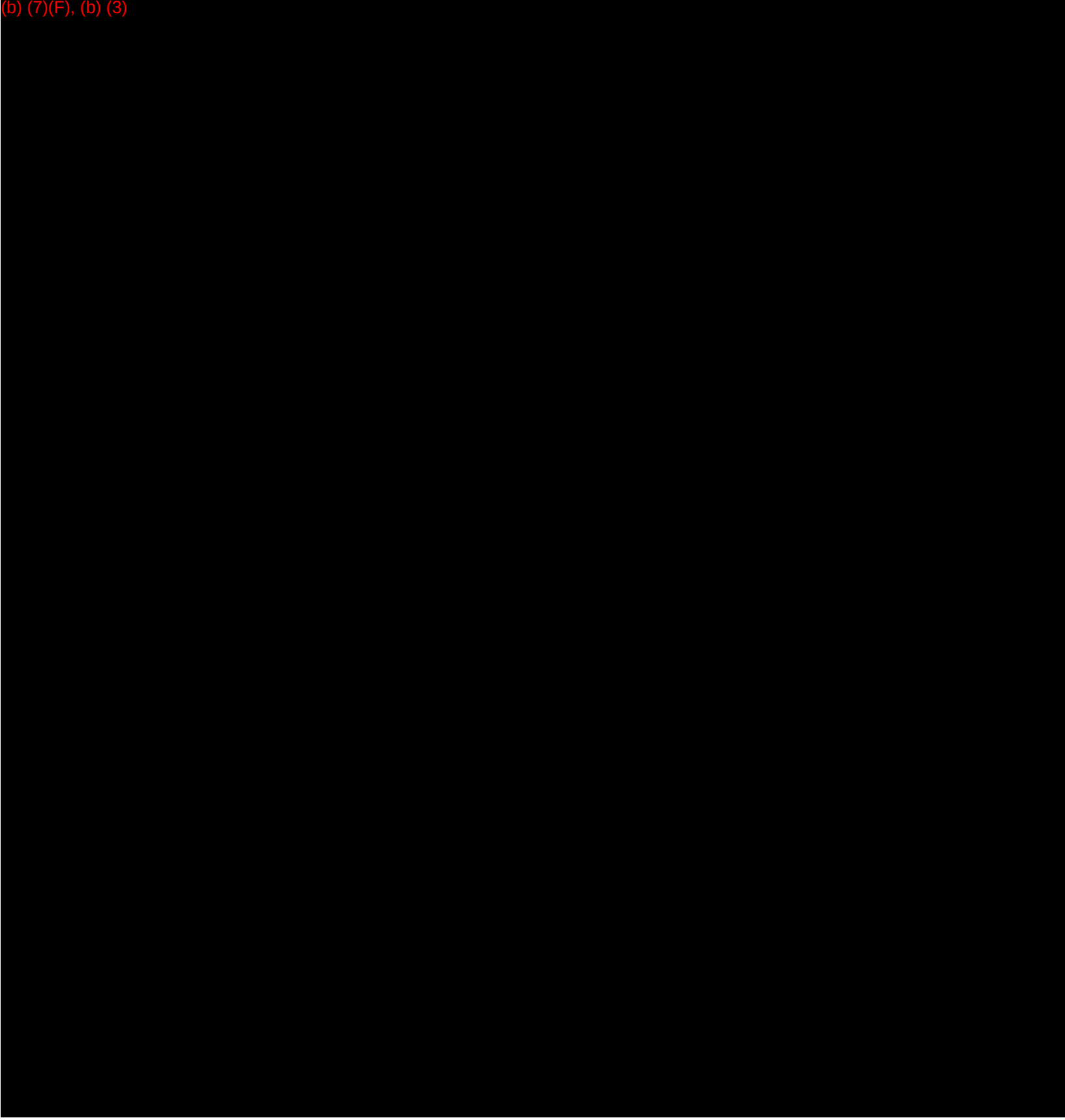


FIGURE YUKS.1
YUKON RIVER SUMMER SCENARIO MAP

(b) (7)(F), (b) (3)

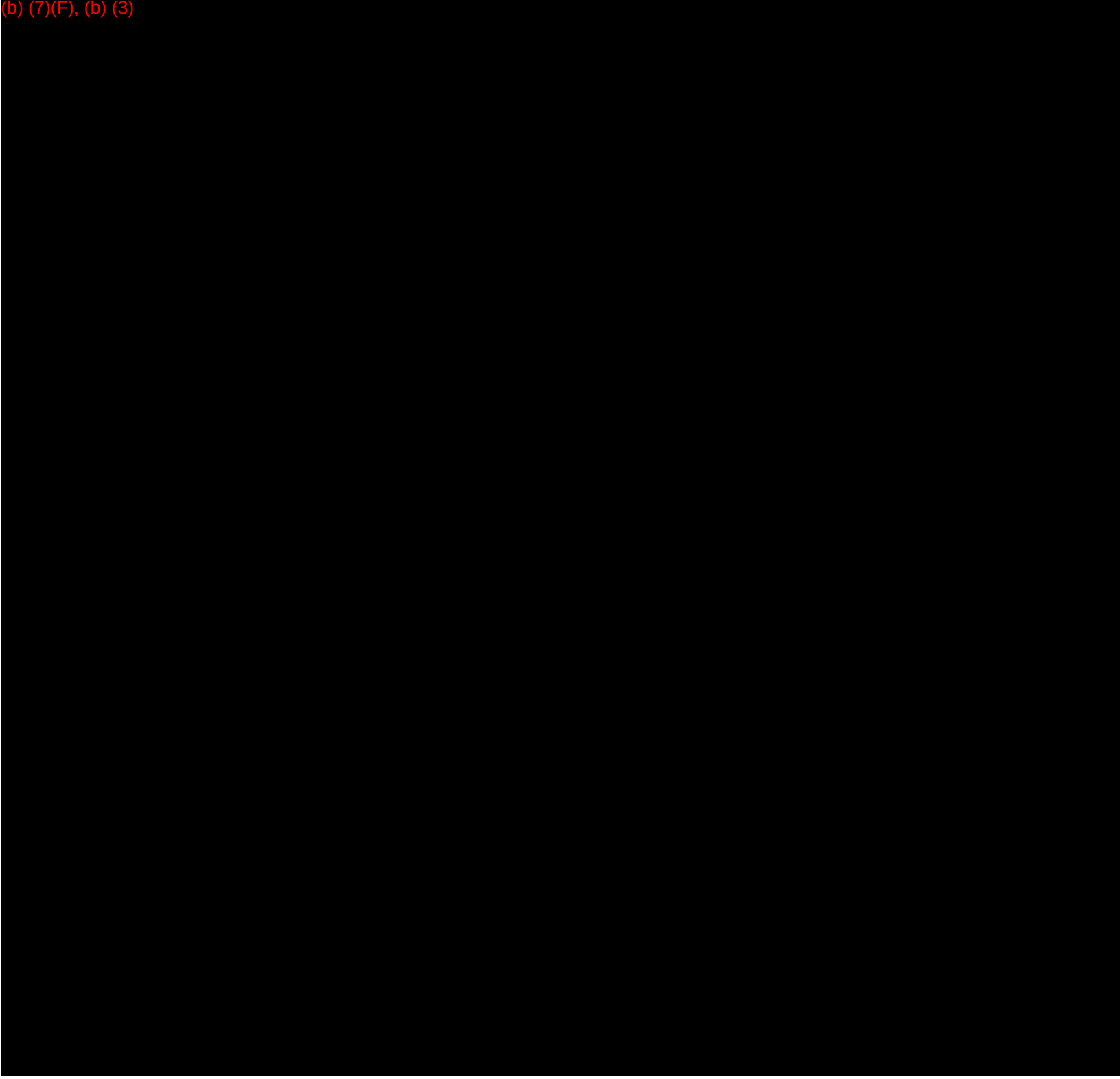


FIGURE YUKS.2
YUKON RIVER SUMMER SCENARIO MAP
(CONTINUED)

(b) (7)(F), (b) (3)

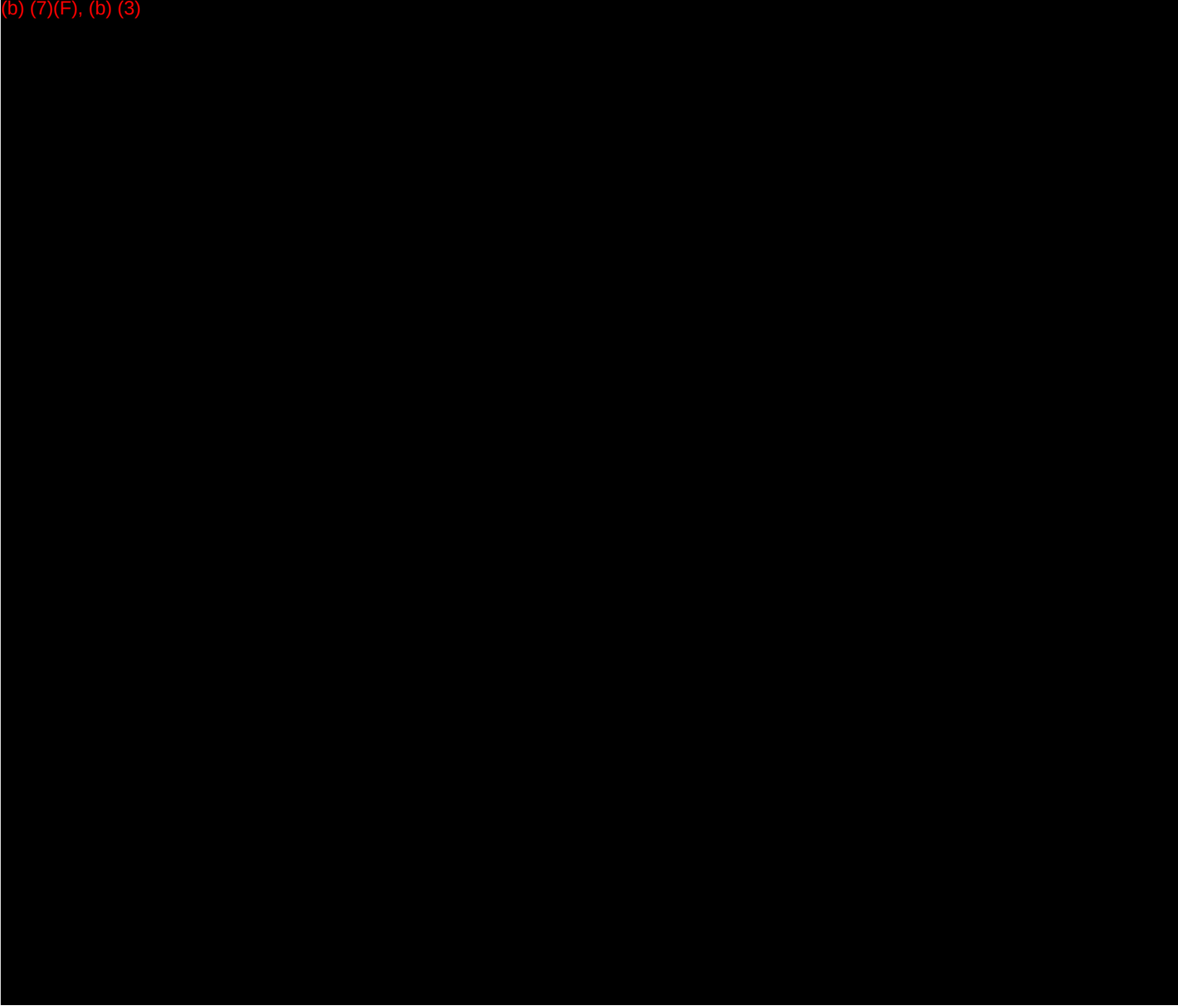


FIGURE YUKS.3
YUKON RIVER SUMMER SCENARIO DEPLOYMENT MAP

TABLE YUKS.1 YUKON RIVER SUMMER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100)	Hour 1-3 Day 1 (1100-1300)	Hour 3-5 Day 1 (1300-1500)	Hour 5-8 Day 1 (1500-1800)	Night Shift (Hour 8-20) Day 1 (1800-2400); Day 2 (000-0600)
Situation/Status • **Weather** • **Environmental**	Summer season. Winds from NE at 10 mph. Temperature 70ºF.	Oil escapes from the pipeline at a pressure of 600 psi for the first two days and 86 psi for the following several hours. By the time the spill source is controlled, a total of (b) (7)(F), is spilled.			
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site Security: Safety, site control, surveillance.	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, develop and implement leading edge tracking. Protect life safety. Preserve the crime scene.			
	Keep oil on land and out of Burbot Creek.	Shut in pipeline. Contain on land if poss ble. Implement recovery operations. Install HC-320 hydraulic clamp.			
	Keep oil out of Yukon River.	Deploy task forces. Mobilize resources to maximize containment and recovery. Contain as near to pipeline as poss ble.			
	Implement recovery operations.				
	Protect sensitive resources and wildlife.	A wildlife response operation is immediately initiated as outlined in Section 1.7.10, “Wildlife Protection”.			
	Preserve the crime scene.	No work on pipeline until FBI completes initial investigation.			
	Install HC-320 hydraulic clamp.				
	Agency and stakeholder notification.	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	OCC shuts in the pipeline and the remote gate valves (RGVs) in Section 5 are closed. The first responder to arrive on site (TF-1 at T + 0.5 hours) brings air monitoring equipment and completes an initial site safety assessment. The information is radioed to the Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site. The safety specialist at Prospect Response Base mobilizes to the spill site.	Security from the Yukon Response Base initiates access control on both the workpad and the Haul Road due to potential explosion/fire hazard. Yukon Ventures are notified that if the wind changes direction they may need to evacuate their facility. The Alaska State Troopers are notified of the sabotage event and they in turn notify the FBI. The FBI (out of Fairbanks) is mobilized to conduct an initial assessment of the site. They are flown to the scene via helicopter along with an Alyeska OC and an off-duty P&CM from Fairbanks.	The FBI conducts their initial assessment. The safety specialist arrives on-site and conducts a “Site Safety and Control Analysis” (Form ICS 201-5) to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination and safety objectives on the Yukon River. The Mobile Command Post arrives with the “Go Team” to provide support services.	FBI completes their initial assessment by T + 6 hours (1600).	
	The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is > 20%, additional fire and safety precautions are initiated to eliminate ignition sources. Incipient level fire suppression equipment is provided on site. This may include a fire truck(s), wheeled 150-pound extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations are conducted from outside the hot zone to control advanced exterior fires utilizing high volume handlines. The primary mission of firefighters is personnel safety and protection. As containment sites are established, fire extinguishers are positioned at each site to provide incipient fire response. Two firefighters are mobilized from the North Slope (Mutual Aid) and flown by the Ga braith Maintenance Base/PS04 helicopter to Prospect where they mobilize the fire truck to the Dalton Highway (b) (7)(F), (b) (3)		The Prospect Response Base fire truck arrives with the Mutual Aid firefighters at T + 5 hours.		

TABLE YUKS.1 (CONTINUED) YUKON RIVER SUMMER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100)	Hour 1-3 Day 1 (1100-1300)	Hour 3-5 Day 1 (1300-1500)	Hour 5-8 Day 1 (1500-1800)	Night Shift (Hour 8-20) Day 1 (1800-2400); Day 2 (000-0600)
Discharge Tracking	Aerial tracking is done visually by Prospect Response Base/PS05 helicopter and a Prospect Response Base responder. Ground observations are made by containment and recovery operations personnel who establish the extent of spread of the spilled oil.	The frequency of oil trajectory observations are almost continuous during the initial hours of the response. Incident Commander tracks discharge on a situation status map. Incident Command Staff formulate or adjust incident objectives, define strategies, and prioritize actions.	Tracking reports are made to the Incident Command Center via radio on an hourly basis at least.	As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.	
Protection of Environmentally Sensitive Areas (ESAs)	The Yukon River is an anadromous fish stream and is considered critical habitat. Moose are widely distributed in this area. A concentrated nesting habitat for the Peregrine falcon and other raptors is located along the Yukon River downstream of the Yukon River Bridge. Activity in this area after April 15 is restricted.				
Response Actions	The Prospect Response Base RBS assumes the position of Initial Incident Commander and the Yukon Response Base P&CM assumes the position of Operations Section Chief. As soon as is practicable, the Prospect Response Base RBS transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. The Yukon Response Base P&CM mobilizes the Yukon Response Base and Prospect Response Base responders to the confluence of Burbot Creek and the Yukon River, Prospect Response Base responders and the Stevens Village to the Yukon River adjacent to the mouth of the Ray River, a Rampart crew to Crescent Island, and the Fairbanks Initial Response Team to repair the pipeline. Baseline contractor 25 person night shift composed of off-duty personnel. They are requested to report to the Yukon Response Base staging area by 1900 hours.				
Task Force 1 **Containment and Recovery at Burbot Creek**	The priority is to minimize the volume of oil entering the Yukon River. A 3-person Yukon Response Base crew mobilizes and arrives at T + 0.5 hour with equipment shown in Table YUKS.3. The Yukon Response Base crew takes a small dozer down the north bank of the Yukon to Burbot Creek and installs an inverted culvert system across the mouth of the creek. A Fairbanks Response Base operator drives to PS07 and mobilizes the PS07 vac truck to assist TF-1.	The inverted culvert is installed by T + 2 hr. TF-1 then initiates oil recovery operations at this site utilizing a Pedco mini-weir skimmer with a derated recovery capacity of(b) (7)(F), (b)	Approximately(b) (7)(F), of oil are contained at the mouth of the Burbot Creek. Recovered oil is stored in open-top tanks. Recovered oil is taken by vac truck to PS06 for the temporary storage in Tank 160 and eventual reinjection into the pipeline. Yukon Response Base and PS07 vac trucks arrive on site.		The baseline contractor night shift reports on-site at 1900 hours.
Task Force 2 **Diversion and Recovery at Yukon River**	Two Prospect Response Base responders mobilize to the Yukon Response Base to mobilize equipment (Table YUKS.4) for TF-2 to the Yukon River boat launch. The Stevens Village crew mobilizes to the Yukon River boat launch.	The Prospect Response Base responders arrive at the Yukon Response Base and mobilize equipment to the Yukon River boat launch.	The Stevens Village crew, consisting of five people and two boats, arrive at the Yukon River boat launch at T + 4.5 hours, meet up with TF-2, and mobilize equipment to Yukon River adjacent to the mouth of the Ray River.	TF-2 arrives at the mouth of the Ray River at T+5 hr. TF-2 starts setting up containment boom.	Diversionary and collection booming is completed by 1900 hours. The Baseline contractor night shift arrives at T +9 and takes over containment operations. Recovery operations are initiated at T + 10 hours utilizing a Komara 12 K Skimmer with a derated recovery capacity(b) (7) . Recovered oil is placed into open top tanks. Approximately (b) (7)(F), of oil are contained at this location. As initial storage capacity is exceeded, additional open top tanks are set up for temporary storage of recovered oil. The oil which initially escaped the containment at the mouth of Burbot Creek and any oil which might escape the containment established at the mouth of the Ray River would be in the form of patches of sheen. These sheens would follow the river currents close to the north bank of the Yukon River. The sheens would evaporate, dissolve in the water column and bind with inorganic silt particles and be removed from the surface of the water quickly due to available mixing energies.

TABLE YUKS.1 (CONTINUED) YUKON RIVER SUMMER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1000-1100)	Hour 1-3 Day 1 (1100-1300)	Hour 3-5 Day 1 (1300-1500)	Hour 5-8 Day 1 (1500-1800)	Night Shift (Hour 8-20) Day 1 (1800-2400); Day 2 (000-0600)
Task Force 3 **Containment and Recovery at** (b) (7)(F), (b) (3)	Four Prospect Response Base responders mobilize with equipment (Table YUKS.5) to (b) (7)(F),		Prospect Response Base responders are assigned to the area on Burbot Creek from the Haul Road, upstream to the pipeline. They arrive at T + 3 hours and block the 30-inch CMPs a(b) (7)(F), (b) (3) stop oil from flowing past the highway. This is completed in T + 4.5 hours. Approximately (b) (7)(F), of oil are contained upstream of the Dalton Highway. An Aqua Guard skimmer with a derated capacity o(b) (7)(F), (b) is set up to recover and store oil. The vac truck from Prospect Response Base is utilized to transport recovered oil to PS06 for temporary storage in Tank 160 and eventual re-injection into the pipeline.		Baseline contractor night shift arrives at T + 9 and takes over containment and recovery operations.
Task Force 4 **Diversion, Containment and Recovery at Crescent Island (CS6-2)**	The Rampart crew mobilizes by boat up the Yukon River to CS6-2. An off-duty P&CM from Fairbanks mobilizes with the FBI by Fairbanks helicopter to the spill site.	The off-duty P&CM arrives at T + 3.	The off-duty P&CM is dispatched in the Prospect Response Base/PS05 helicopter to CS6-11B. Equipment from the prestaged conex is slung by helicopter approximately 5 miles to the downstream end of Crescent Island adjacent to CS6-2. The Rampart Village crew, consisting of an eight-man crew and three boats travel upstream from Rampart to Crescent Island.	The Rampart Crew arrives at CS6-2 at T + 5 hours. By T + 6 hours all equipment from CS6-11B has been moved to Crescent Island and a diversion booming and containment and recovery operation is established. No oil reaches this site.	The helicopter brings tenting equipment to Crescent Island Yukon Response Base and the Rampart crew and off-duty P&CM spend the night on the island.
Task Force 5 **Pipeline Repair**	The Fairbanks Initial Response Team, consisting of six individuals, is mobilized out of Fairbanks to repair the hole in the pipeline by installing a HC-320 hydraulic clamp.			The Fairbanks Initial Response Team arrives on site at 1800 hours. By the time this team arrives to repair the pipeline, the FBI have completed their initial investigation.	The HC-320 hydraulic clamp is installed by 2000 hours.
Task Force 6	The Environment Unit activates the Wildlife Protection and Rehabilitation Plan.				
Wildlife Protection / Rehabilitation	Environment Unit takes the following steps: CCI is requested to provide 10 wildlife hazers. CCI is requested to mobilize the wildlife treatment center stationed at Fairbanks. CCI wildlife hazers begin mobilizing to the spill site.	Environment Unit takes the following steps: ACS and SERVS are placed on standby for the poss ble use of their wildlife response facilities or provisions of additional hazing and/or capture and treatment equipment.	Environment Unit takes the following steps: The International Bird Rescue Research Center (IBRRC) is notified and requested to mobilize a full scale hazing operation as well as a capture and stabilization operation. This includes making the Anchorage wildlife facility operational.	CCI arrives on site with the wildlife treatment center at T + 8 hours.	
Waste Management			Recovered oil is transferred by vac truck to PS06 for temporary storage in Tank 160. Within 36 hours, arrangements have been made to inject oil into the pipeline at PS06. Solid waste will be segregated in clear bags: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area at PS06. This soil will be thermally remediated on site.		

TABLE YUKS.1 (CONTINUED) YUKON RIVER SUMMER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 20) + Day 2 (0600) +
Longer Term **Response Actions**	For the first few days, the response crews stay in local housing. Alyeska immediately makes arrangements to bring in a 100-person camp and place it at PS06. Four days are required to dismantle the camp, move it to PS06 and put it back together. The camp is on line and operational by the evening of June 15. As oil continues to pond at (b) (7)(F), an additional skimmer is placed into operation to expedite recovery of oil. A 4' Pedco weir skimmer with a derated recovery rate of 240 bph (10,080 gph) is brought in from PS07. Once gross oil is recovered, additional baseline contractor crews are brought in to facilitate removal of remaining oil. Six large vac trucks (300 barrels each) are mobilized from the North Slope for transport of recovered oil (PS01 and Alaska Clean Seas). These trucks are on location in less than 24 hours. Note that these vehicles are not highway licensed and a special permit would be required. Two 249-barrel barges are trucked up from Valdez-SERVS to transport oil that has been placed in temporary storage at the mouth of the Ray River. This oil is transported back to the vicinity of the Yukon River Bridge where it is off-loaded into large vac trucks. Recovered oil is transferred to PS06 for temporary storage in Tank 160. Within 36 hours, arrangements have been made to inject oil into the pipeline at PS06
Task Force 6 **Wildlife Protection / Rehabilitation**	The IBRRC is on location within 24 hours and takes over coordination of the overall wildlife response operation.
Task Force 7 **Shoreline Clean-up Plan**	As the spread of oil is secured, the cleanup of oil stranded on the shoreline and contaminated soil removal will be an added focus of the incident action plan. The response organization will need to monitor water levels because rising water levels can re-mobilize shore-stranded oil. During the days that follow, cleanup activities focus on the oil remaining along the shorelines of Burbot Creek, the Yukon River, and other affected drainages. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. Oiled gravel on the workpad is stored in a temporary lined area for later cleaning or incineration and reuse. The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel mixed with pea, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge with recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are utilized to recover deeper pools of oil when poss ble. Oiled peat slurries may be removed by small loaders and transported to stable areas for cleaning. Peat outcrops will be raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about 1 week, the shoreline cleanup crews recover about one-half of the oil volume estimated to remain onshore after initial recovery efforts are completed. The initial shoreline cleanup is determined to be complete, and long term cleanup techniques are implemented along with a long-term monitoring program. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations of resources and other organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE YUKS.2 YUKON RIVER SUMMER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1000-1100								Hour 1-3 1100-1300							Hour 3-5 1300-1500						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security			--	--	--	--	--	--	2	--	--	--	--	--	--	2	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1	1	--	1 Prospect Response Base/PS05 helicopter (1)[4]	--	--	--	--	1	--	1 Prospect Response Base/PS05 helicopter (1)[4]	--	--	--	--	1	--	Prospect Response Base/PS05 helicopter (1)[4]	--	--	--	(b) (7)(F), (b)(3)
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	Prospect	--	(b) (7)(F), (b)(3)	--	
Fire Protection	Fire Protection	FP	--	--	--	Ga braith helicopter (1)	--	--	--	--		--		--	--	--	--		--	1 Prospect Response Base fire truck (2)	--		--	
Safety	Site Safety and Control[6]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	1	--	--	--		--	
Response	Burbot Creek (CS5-26)	TF-1 Containment and Recovery at Burbot Creek	3	3	Vac Truck (1)[8] D-3 dozer (1)[8]	Inclined Culvert Kit Pedco 2ft skimmer	1	[redacted]	4	(b) (7)(F), (b)	3	D-3 dozer (1)[8] 1 ea. 100 bbl vac truck (1)[8]	Inclined culvert kit Pedco 2-ft skimmer	1	(b) (7)(F), (b)(3)	4	(b) (7)(F), (b) (3)	4	D-3 dozer (1)[8] 2ea. 100 bbl vac trucks (2)[8]	Inclined culvert kit Pedco 2-ft skimmer	1		4	
	Yukon River	TF-2 Diversion and Recovery at Yukon River	--	--	--		--	--			2	--				16		2	----					
	(b) (7)(F), (b)(3)	TF-3 Containment and Recovery at DHMP (b) (7)(F),	--	--	--	--	--	--	--	--	--	--	--	--	--	--		4	100 bbl vac truck (1)	Culvert blocking kit Aqua Guard skimmer	1		10	
	Crescent Island (CS6-2)	TF-4 Diversion, Containment and Recovery at Crescent Island	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Source Control	Pipeline Repair	TF-5 Pipeline Repair	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE YUKS.2 (CONTINUED) YUKON RIVER SUMMER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1000-1100								Hour 1-3 1100-1300							Hour 3-5 1300-1500						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Wildlife	Wildlife Hazing	TF-6 Wildlife Hazing	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--	--	--	--	--	--	--	Mobile Command Post (12)	--	--	--	--	--	--		--	--	--	--	--
Personnel Total			Note[7]	4	2	2					8	14	1					14	4	3				
Mechanical Equipment Total			--		2	3						2	2						4	4				

TABLE YUKS.2 (CONTINUED) YUKON RIVER SUMMER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-8 1500-1800								Hour 8-20 1800-0600							Hour 20+ 0600+						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	--	--	--	--	--	--	2	--	--	--	--	--	--	2	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	1	1	--	1 Prospect Response Base/PS05 helicopter (1)[4]	--	--	--	--	1	--	1 Prospect Response Base/PS05 helicopter (1)[4]	--	--	--	--	1	--	1Yukon Response Base/PS06 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--		--	1 Prospect Response Base fire truck (2)	--	--	--	--		--	1 Prospect Response Base fire truck (2)	--	--	--	--		--	1 Prospect Response Base fire truck (2)	--	--	--	--
Safety	Site Safety and Control[6]	--	1	1	--	--	--	--	--	(b) (7)(F), (b)(3)	1	--	--	--	(b) (7)(F), (b)(3)	--	(b) (7)(F), (b)(3)	1	--	--	--	(b) (7)(F), (b)(3)	--	(b) (7)(F), (b)(3)
Response	Burbot Creek (CS5-26)	TF-1 Containment and Recovery at Burbot Creek	4	4	D-3 dozer (1)[8] 2ea. 100 bbl vac trucks (2)[8]	Inclined culvert kit Pedco 2-ft	1	(b) (7)(F), (b)(3)	4		4 plus 5 night shift	D-3 dozer (1)[8] 2 ea. 100 bbl vac trucks (2)[8]	Inclined culvert kit Pedco 2 ft skimmer	1		4		4 plus 5 night shift	D-3 dozer (1)[8] 2 ea. 100 bbl vac trucks (2)[8]	Inclined culvert kit Pedco 2 ft skimmer	1		4	
	Yukon River	TF-2 Diversion and Recovery at Yukon River	7	7	--	1 Fairbanks helicopter (1) 5,400 ft of boom 4 Riverboats (4)[8] Komara 12K	1		16		7 + 10 night shift	2 ea 249 barrel barges	1 Fairbanks Response Base helicopter (1) 5,400 ft of boom 4 riverboats (4)[8] Komara 12K skimmer	1		16		7 + 10 night shift	2 barrel barges	1 Fairbanks helicopter (1) 5,400 ft of boom 4 riverboats (4)[8] Komara 12K skimmer	1		16	
[redacted]		TF-3 Containment and Recovery at (b) (7)(F), (b)	4	4	100 bbl vac truck (1)[8]	Culvert blocking kit Aqua Guard Skimmer	1		10		4 plus 10 night shift	100 bbl Vac Truck (1)[8]	Culvert blocking kit Aqua Guard skimmer	1		10		4 plus 10 night shift	100 bbl vac truck (1)[8] 6 ea. 300 bbl vac trucks (6)	Culvert blocking kit Aqua Guard skimmer Pedco 4ft skimmer	1 1		10	
	Crescent Island (CS6-2)	TF-4 Diversion, containment and Recovery at Crescent Island	8 plus 1 P&CM	8 plus 1 P&CM	--	1 Prospect Response Base/PS05 helicopter (1)[4] 3 boats Diversion booming	--	--	--	--	8 plus 1 P&CM	----	1 Prospect Response Base/PS05 helicopter (1)[4] 3 boats Diversion booming	--	--	--	--	8 plus 1 P&CM	--	1Prospect Response Base/PS05 helicopter (1)[4] 3 boats Diversion booming	----	--	--	--

TABLE YUKS.2 (CONTINUED) YUKON RIVER SUMMER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-8 1500-1800								Hour 8-20 1800-0600							Hour 20+ 0600+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Source Control	Pipeline Repair	TF-5 Pipeline Repair	6	6	--	HC-320 hydraulic clamp kit	--	--	--	--	6	--	HC-320 hydraulic clamp kit	--	--	--	--	6	--	HC-320 hydraulic clamp kit	--	--	--	--
Wildlife	Wildlife Hazing	TF-6	--	--	--	--	--	--	--	--	10 CCI	--	Wildlife treatment center	--	--	--	--	10 CCI 10 IBRRC	--	Wildlife treatment center	--	--	--	--
On-Scene Comms.	Communications Support	Comms.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			Note[7]	34	4	9					69	4	8					79	10	9				
Mechanical Equipment Total					4	14						6	14						12	15				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the “People for Ops” column.

– Not arrived on site. May be mobilized or en route.

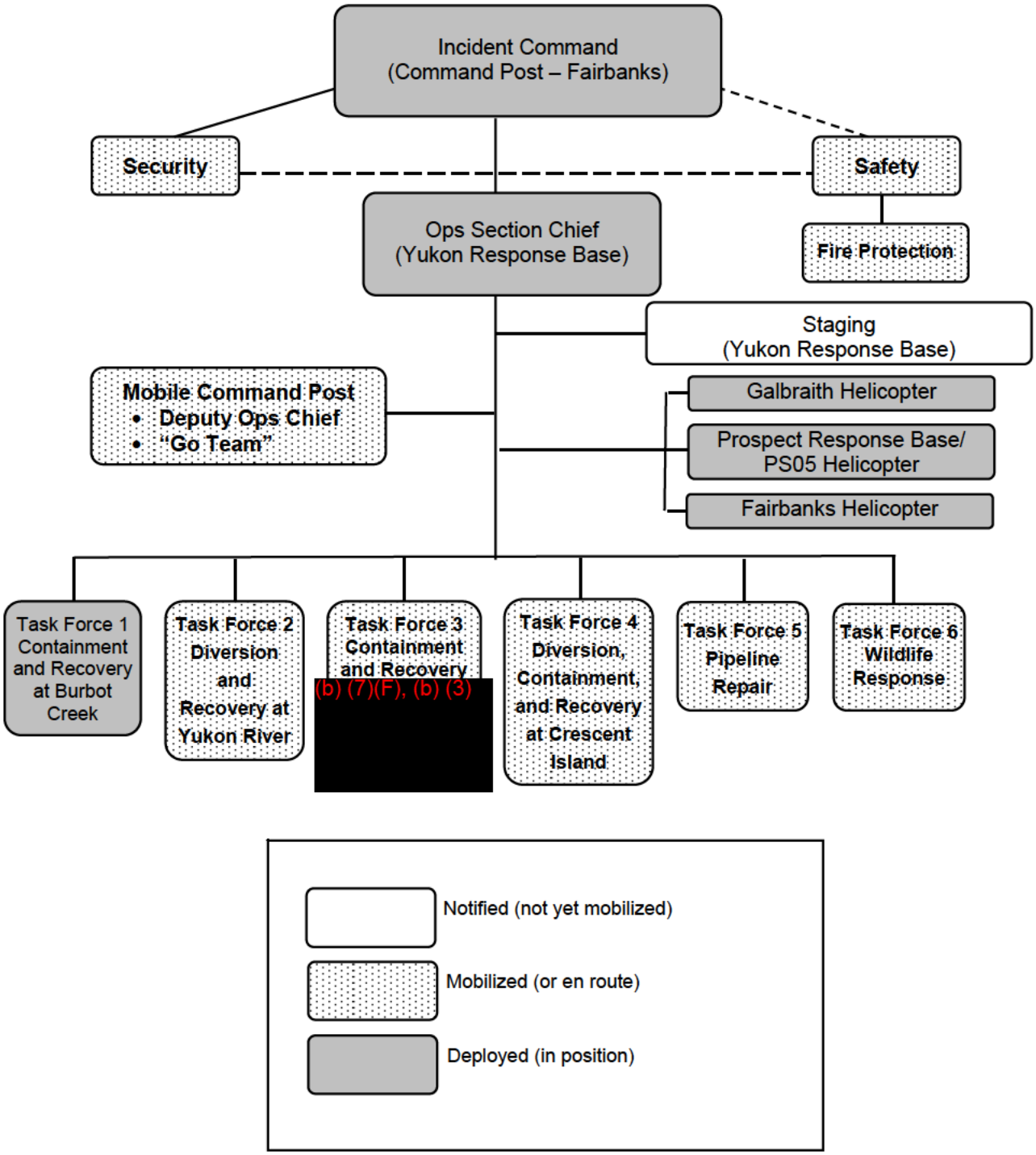


FIGURE YUKS.4
YUKON RIVER SUMMER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

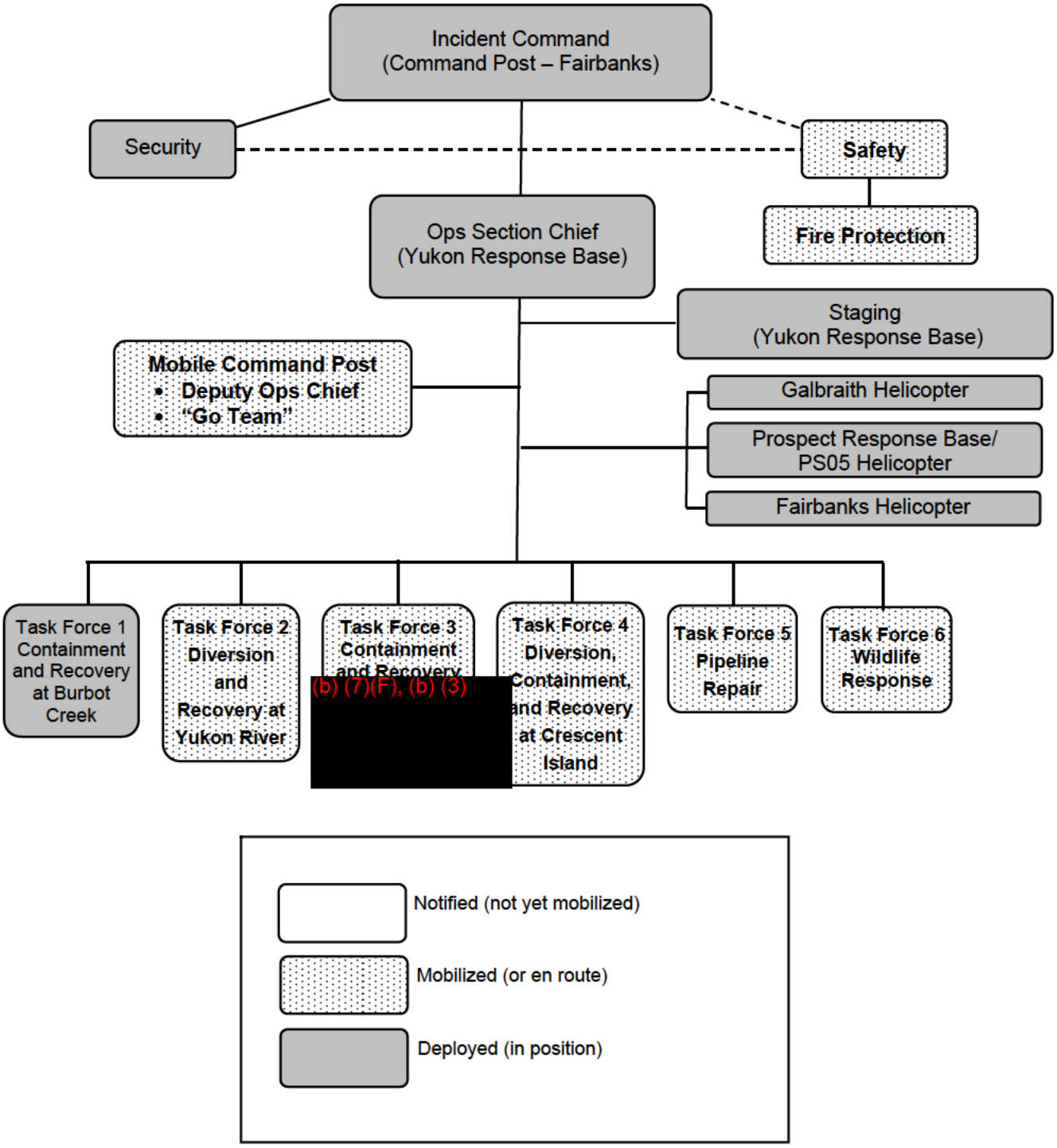


FIGURE YUKS.5
YUKON RIVER SUMMER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

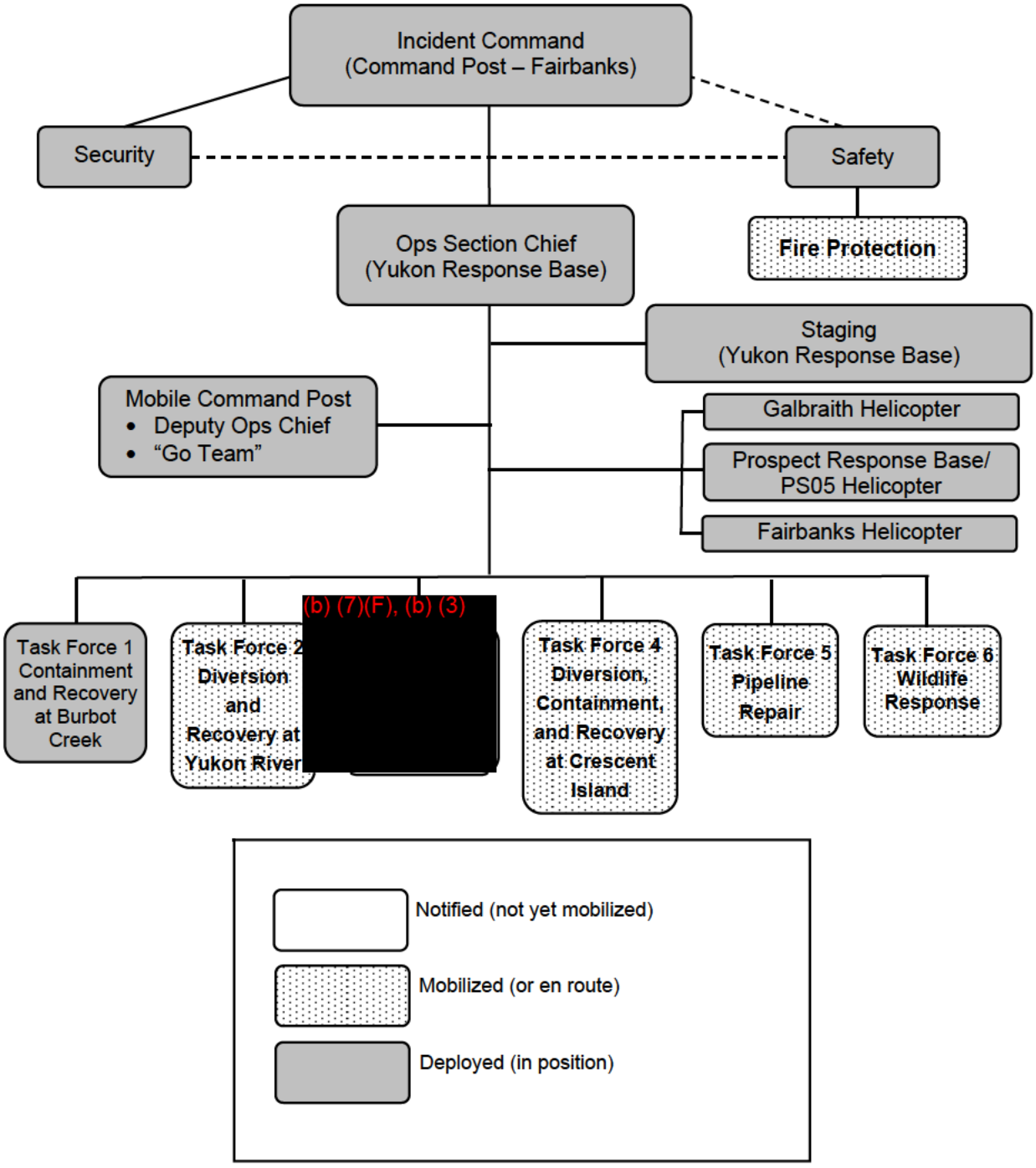


FIGURE YUKS.6
YUKON RIVER SUMMER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-5

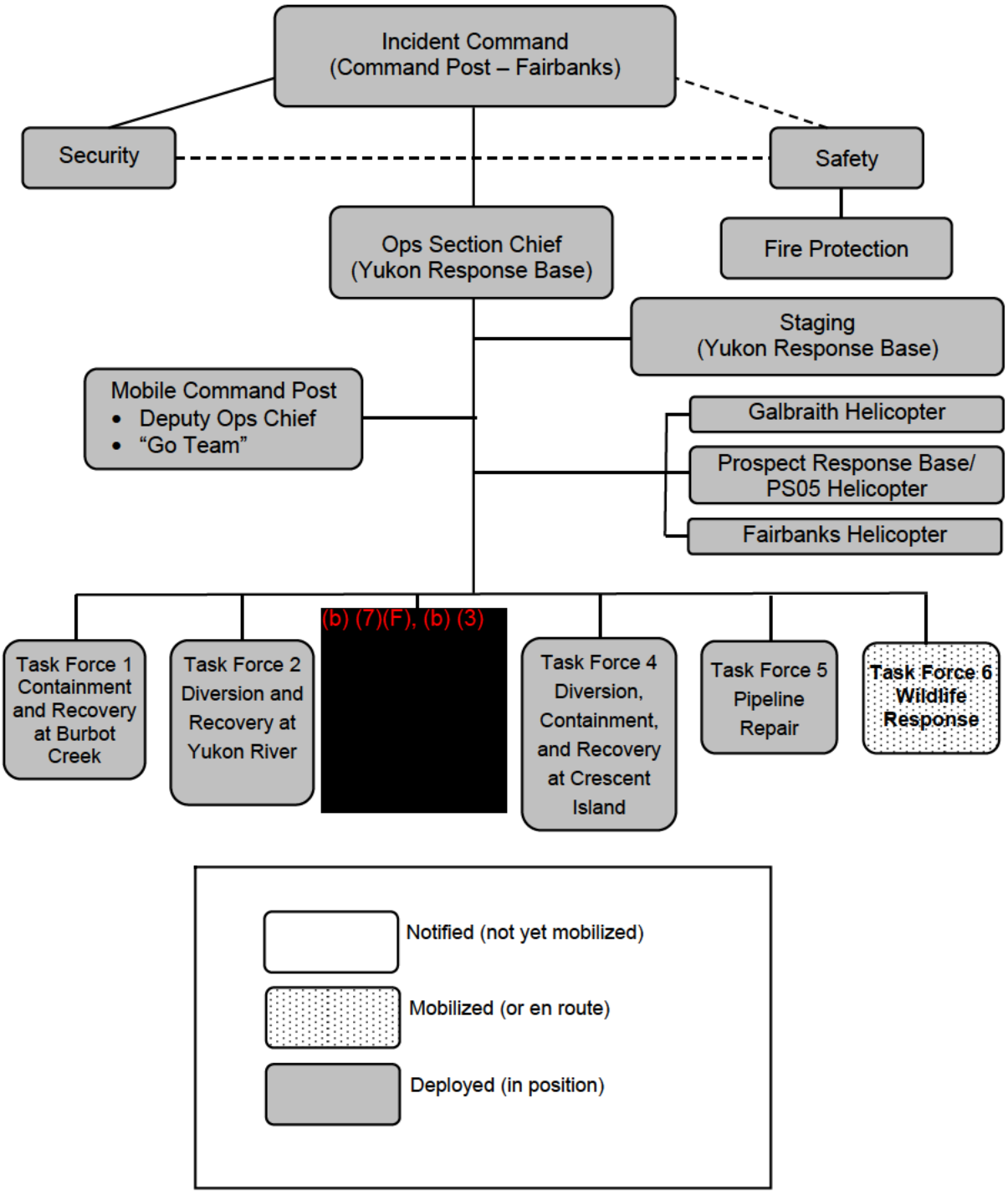


FIGURE YUKS.7
YUKON RIVER SUMMER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 5-8

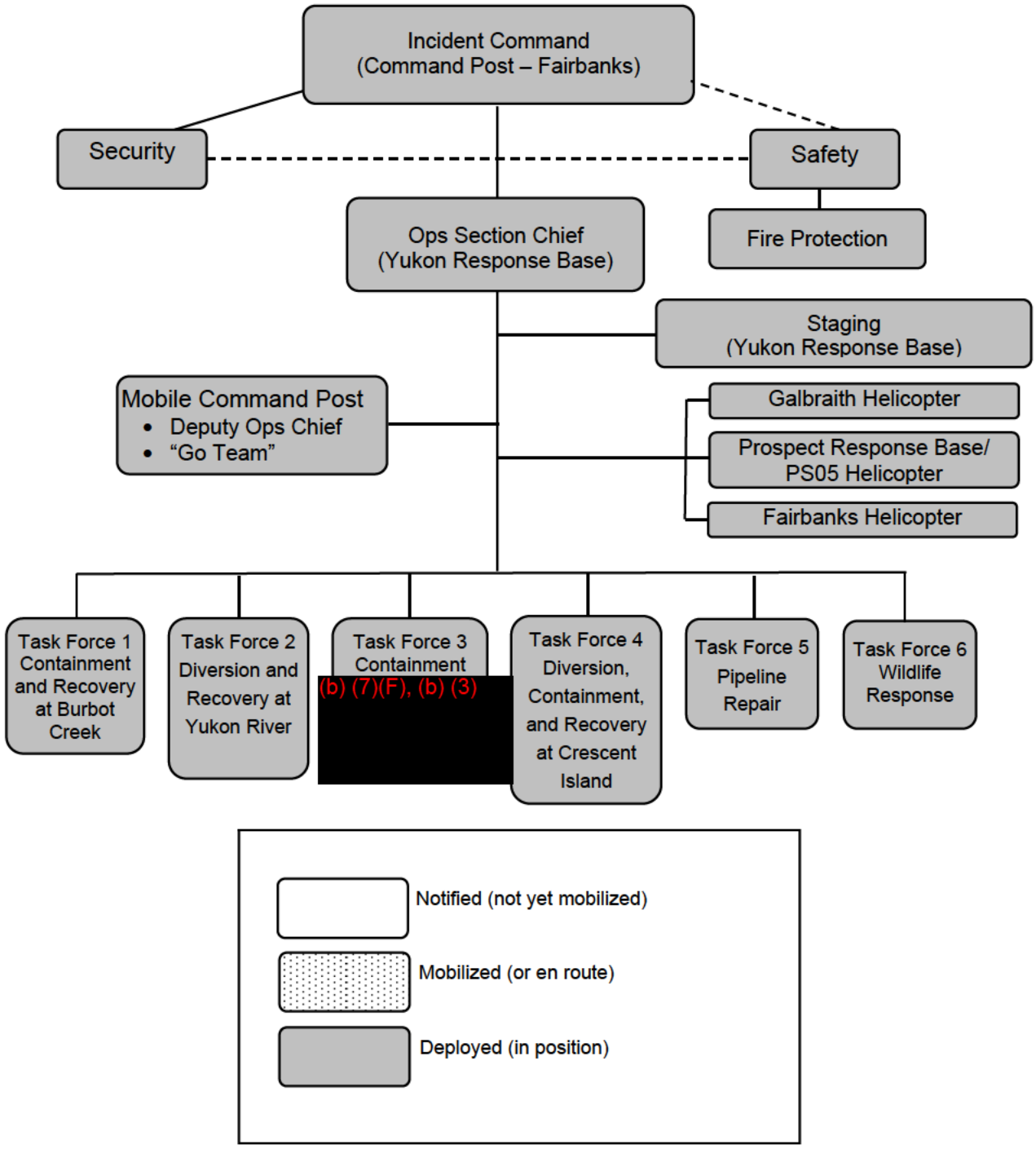


FIGURE YUKS.8
YUKON RIVER SUMMER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 8+

TABLE YUKS.3 YUKON RIVER SUMMER SCENARIO
RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT THE MOUTH OF BURBOT CREEK (CS5-26)

Equipment/Personnel (Quantity)	Location	Purpose	ETA On-Site
D-3 dozer	Yukon Response Base	Construction of underflow dam	T + 0.5 hr
Inclined culvert kit	Yukon Response Base	Construction of underflow dam	T + 0.5 hr
Pedco mini-skimmer (2ft)	Yukon Response Base	Skimming	T + 0.5 hr
2,000 to 3,000-gallon open top storage tanks (4)	Yukon Response Base	Temporary storage	T + 0.5 hr
YRFB Responders (3) (TF-1)	Yukon Response Base	Labor	T + 0.5 hr
4,200 gal Vac truck (1) with operator	Yukon Response Base	Storage and hauling of recovered oil	T + 0.5 hr
4,200 gal vac truck (1) with Fairbanks Response Base operator	PS07	Storage and hauling of recovered oil	T + 4 hr
Off-Shift Baseline Contractors (8)	Baseline Contractor	Night Shift	T + 9 hr

TABLE YUKS.4 YUKON RIVER SUMMER SCENARIO
RESOURCE MOBILIZATION FOR OIL DIVERSION AND COLLECTION ON THE YUKON RIVER ADJACENT TO THE MOUTH OF THE RAY RIVER

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Boom (5,400 feet)	Yukon Response Base	Diversion and containment booming	T + 3-5 hr
Komara 12 K skimmer	Prospect Response Base	Oil recovery	T + 3-5 hr
5,000-gallon open top storage tanks (8)	Yukon Response Base	Temporary storage	T + 3-5 hr
Responders (2) (TF-2)	Prospect Response Base	Labor, mobilize equipment to Yukon River boat launch	T + 5 hr
Riverboats (2)	Yukon Response Base	Work platform	T + 3-5 hr
Helicopter (1)	Fairbanks	Transport equipment	T + 3 hr
Crew (5) (TF-2)	Stevens Village	Labor	T + 5 hr
Riverboats (2)	Stevens Village	Work platform/transport	T + 5 hr
2,000 to 3,000-gallon open top tanks (8)	Prospect Response Base	Temporary storage	T + 3-5 hr
Off-Shift Baseline Contractors (9)	Baseline Contractor	Night Shift	T + 9 hr

TABLE YUKS.5 YUKON RIVER SUMMER SCENARIO RESOURCE MOBILIZATION FOR OIL CONTAINMENT AND RECOVERY AT (b) (7)(F), (CS5-26)

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Culvert blocking materials (from lumber pallet)	Prospect Response Base	Block CMPs on Dalton Highway	T + 3hr
Aquaguard skimmer	Prospect Response Base	Recovery of oil	T + 3 hr
4,200 gal Vac truck with operator	Prospect Response Base	Storage and transport of oil	T + 3 hr
Responders (4) (TF-3)	Prospect Response Base	Labor	T + 3 hr
2,000 to 3,000-gallon open top storage tanks (10)	Prospect Response Base	Temporary storage	T + 3 hr
Fire Truck with 2 Mutual Aid firefighters	Prospect Response Base	Contingency	T + 5 hr
Pedco 4ft skimmer	PS07	Recovery	T + 24 hr
Ga braith Maintenance Base Helicopter	Ga braith	Transport	T + 3 hr
Off-Shift Baseline Contractors (8)	Baseline Contractor	Night Shift	T + 9 hr

TABLE YUKS.6 YUKON RIVER SUMMER SCENARIO RESOURCE MOBILIZATION FOR OIL CONTAINMENT AND YUKON RIVER – CRESCENT ISLAND (CS6-2)

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Boats (3)	Rampart	Transport	T + 5 hr
Boom (1000 feet)	CS6-11B	Containment	T + 5 hr
Responders (8) (TF-4)	Rampart	Labor	T + 5 hr
Off-duty P&CM (1)	Fairbanks Response Base	Labor	T + 5 hr
Helicopter (1)	Prospect Response Base	Transport (shared with aerial tracking)	T + 5 hr

TABLE YUKS.7 YUKON RIVER SUMMER SCENARIO
EQUIPMENT AND MANPOWER MOBILIZATION FOR SOURCE CONTROL AT YUKON RIVER

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
48-inch x 22½-inch HC-320 hydraulic clamp	Fairbanks Response Base	Stopping leak and allowing pipeline to return to operation	T + 8 hr
Crane (18 ton)	Fairbanks Response Base	Installation of the clamp	T + 8 hr
Fork Lift	Yukon Response Base	Moving materials	T + 8 hr
185 CFM air compressor	Yukon Response Base	Operations of air driven wrenches	T + 8 hr
1½-inch impact gun (1)	Fairbanks Response Base	Tightening bolts	T + 8 hr
Rigging package (1)	Fairbanks Response Base	Slinging the clamp	T + 8 hr
1 each 1-inch female to 1½-inch male adaptor	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
1-inch drive torque wrench (1)	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
1-inch drive multiplier (1)	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
1½-inch drive multiplier (1)	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
$3^{7}/_{8}$-inch Knocker wrench (1)	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
Box of half-round bastard files (1)	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
1 each $3^{7}/_{8}$-inch shaved socket 1½-inch drive	Fairbanks Response Base	Special tools for clamp installation	T + 8 hr
Welder (1) TF-5 Fitters (3) TF-5 Operator (1) TF-5 Laborer (1) TF-5	Fairbanks Response Base	Site fabrication, preparation and installation	T + 8 hr

TABLE YUKS.8 YUKON RIVER SUMMER SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table YUKS.8. Oil is retained in four areas: at the culverts crossing the Dalton Highway (b) (7)(F), (b) at the inverted culvert on Burbot (b) (7)(F), (b) (3)), on the Yukon River at the mouth of the Ray River (b) (7)(F), (b)), and on the shorelines of Burbot Creek and the Yukon River ((b) (7)(F), (b)). No oil is retained at the containment site established at Crescent Island. Estimated emulsification rates are shown in Table YUKS.8. Recovery of the (b) (7)(F), (b) of oil trapped on the shorelines is expected to begin after T + 72 hours, therefore no recovery is shown in the table.

Location	Oil Contained (bbl)	Emulsification (%)/ Total (bbl)	Cumulative Oil Recovered (bbl)								
			4 hr	12 hr	24 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)											

Scenario 10. Pump Station 9 Drag Reducing Agent (DRA) Tank

(b) (7)(F), (b) (3)

This scenario depicts representative spill response activities for a spill from a drag reducing agent (DRA) tank hatch.

The scenario is described by six components:

1. Introductory text
2. A deployment map depicting the site location (Figure PS09.1)
3. Timeline matrix (Table PS09.1)
4. On-site resource tally sheet (Table PS09.2)
5. Response organization charts (Figures PS09.2 through PS09.6)
6. Summary of oil fate and estimated recovery table (Table PS09.3)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a deployment map depicting containment site, task force, and staging area locations (Figure PS09.1). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table PS09.1). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table PS09.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures PS09.2 through PS09.6). The final (sixth) component describes the probable fate of the released oil and estimated recovery rates (Table PS09.3).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system.

PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO
3,000-Gallon Spill on Land

Response Type	Amount
Response Planning Standard for the largest oil storage tank at the facility (18 AAC 75.436).	(b) (7)(F), (b) (3)

Source

The spill occurs at Pump Station (PS) 9. The failure occurs due to a flange failure at the bottom of the DRA tank located inside the DRA Building BD-80, releasing approximately (b) (7)(F), of DRA, the entire remaining contents of tank..

Environmental Conditions

Time	0400	**Wind**	6 mph, from W
Season	Summer – June 5	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	49ºF
Visibility	No precipitation	**Tide/Current**	N/A

Environmental Considerations – Pump Station 9, Segment 4

As the DRA spill occurs on pad and there are no immediate Environmentally Sensitive Areas adjoining the pad, impact poss bilities are considered minimal. The closest moving water is Jarvis Creek (approximately 1 mile away) and the PS09 pad is fenced to prevent large animals from migrating through the pump station.

Assumptions

1. Due to its high dynamic viscosity (greater than 100,000 centipoises per second [cps] at 77° F), the DRA remains in the vicinity of the tanker.
2. Elevated lower explosive limit (LEL) presents a fire risk.
3. All DRA is recovered by 2000 hours.

Tactical Summary
Containment and Control Actions

Tactical Reference CP-35-1	Tactics	Equipment CP-35-1
Volume 3, Section 4.1.1	Block flow of DRA by installing berms and/or trenches.	Volume 2, Table PS09.2
Volume 3, Section 4.5.7	Construct containment area for temporary storage of recovery drums.	Volume 2, Table PS09.2
Volume 3, Section 4.1.1	Excavate contaminated soil into stockpile location.	Volume 2, Table PS09.2

PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO
(b) (7)(F), (b) (3)

Support Action Taken

Notification is patterned after the Incident Command System (ICS) made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table PS09.1, Pump Station 9 Drag Reducing Agent Tank Scenario Timeline Matrix).

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. Prior to initiating a response, a "Site Safety and Control Analysis" (Form ICS 201-5) is completed identifying potential hazards, personal protective equipment requirements, and establishment of decontamination. Safety and security measures are initiated.
2. The Delta Response Base RBS assumes the positions of Incident Commander and Operations Section Chief.
3. The Incident Commander issues the following incident objectives: adhere to strict safety precautions, restrict the spread of the DRA, recover the DRA, and remove the contaminated soil.
4. Precautions are taken to minimize the risk of fire. The LEL is regularly monitored. If the LEL is greater than 20 percent, additional fire and safety precautions are initiated to eliminate ignition sources.
5. Incipient level fire suppression equipment is provided; firefighting is limited to incipient fire suppression.
6. Three Delta Response Base responders construct berms and trenches to contain DRA.
7. A crew of 10 laborers from baseline contractor is mobilized out of Fairbanks to assist cleanup. They arrive on site at 1000 to assist in cleanup.
8. The DRA is recovered and placed into 55-gallon recovery drums and temporarily stored inside a containment area. The containment area is built using clean fill and a synthetic liner. The recovered DRA is stored pending shipping and ultimate disposal.
9. Contaminated soil is stockpiled in a lined area for thermal remediation.
10. Removal of contaminated soil.

Oil Trajectory

(b) (7)(F), of DRA is forced out the bottom of the tank, spilling onto the DRA Building floor and out the southern open door of the building onto the pad.

The tracking of spilled DRA is intended to provide both tactical and strategic information to the responders. Discharge tracking of spilled DRA will be done on the ground, by air, or both.

On Ground: Containment and recovery operations personnel will do ground tracking to establish the extent of spread of the spilled DRA.

Reporting: Initially, tracking reports will be made to the incident command center via radio on an hourly basis. As containment and recovery operations become established and the risk of spread is reduced, reporting will be done less frequently.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment",* or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

(b) (7)(F), (b) (3)



FIGURE PS09.1
PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO
DEPLOYMENT MAP

TABLE PS09.1 PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0400-0500)	Hour 1-3 Day 1 (0500-0700)	Hour 3-6 Day 1 (0700-1000)	Hour 6-12 Day 1 (1000-1600)	Night Shift (Hour 12-24) Day 1 (1600-2400); Day 2 (0000-0400)
Situation/Status • **Weather** • **Environmental**	Summer season. Winds out of W at 6 mph. Temperature 49ºF. Clear visibility and no precipitation.	Due to its high dynamic viscosity (>100,000 centipoise per second [cps] at 77ºF), the DRA remains in the immediate vicinity of the DRA tanker.			
	Cause of incident is a flange failure at the bottom of the DRA tank located inside the DRA Building BD-80, releasing approximately 3,000 gallons of DRA, the entire remaining contents of tank..				
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site security: safety, site control, surveillance.	Control site access, evacuate non-essential personnel from vicinity, review initial safety assessment, and develop a site safety plan. Follow appropriate decontamination procedures.			
	Restrict the spread of the spilled DRA.	Investigate cause and stop the source of the leak, if safe. If migration of DRA away from DRA Building is probable, block flow by installing dikes and/or trenches.			
	Recover spilled DRA.	Transfer recovered DRA into 55-gallon drums and temporarily store recovery drums in a lined containment area. Construct containment area with clean fill and a synthetic liner.			
	Remove the contaminated soil.	Minimize the area of soil in contact with the DRA. Excavate contaminated soil into approved, lined stockpile location. Follow appropriate decontamination procedures for equipment.			
	Agency and stakeholder notification.	The following State and Federal Agencies are notified by Operations Control Center (OCC): Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety	Safety: Prior to initiating a response, the first responder to the spill site brings air monitoring equipment and completes an initial site safety assessment. The information is radioed to the Incident Commander and used to verify that all responders have appropriate personal protective equipment (PPE) before entering the spill site.	The safety specialist from Fairbanks Response Base arrives on site at T + 2 hours and completes a "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, PPE requirements, and establishment of decontamination. Fire Prevention: The lower explosive limit (LEL) is continually monitored at the spill site. Work activities are controlled depending upon the LEL. If the LEL exceeds 20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include wheeled 150-pound extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations are conducted using high volume hand lines from outside the hot zone to control advanced exterior fires. Fire extinguishers are available for fighting fires if needed.			
Discharge Tracking	The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by ground surveillance. On-ground observations are made by containment and recovery task force personnel who establish the extent of spread of the spilled DRA.	On-ground observations continue to monitor the extent of spread of the spilled DRA.	As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.		
Protection of Environmentally Sensitive Areas (ESAs)	As the DRA spill occurs on pad and there are no immediate ESAs adjoining the pad, impact possibilities are considered minimal. The closest moving water is Jarvis Creek (approximately 1 mile away) and the PS09 pad is fenced to prevent large animals from migrating through the pump station.				

TABLE PS09.1 (CONTINUED) PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0400-0500)	Hour 1-3 Day 1 (0500-0700)	Hour 3-6 Day 1 (0700-1000)	Hour 6-12 Day 1 (1000-1600)	Night Shift (Hour 12-24) Day 1 (1600-2400); Day 2 (0000-0400)
Response Actions	A Delta Response Base responder notices the DRA spill. The responder notifies the Delta Response Base RBS who in turn notifies the OCC. The Delta Response Base RBS assumes the positions of Initial Commander and Operations Section Chief.	OCC notifies Federal and State agencies (ADEC, NRC, BLM, and ADNR). Baseline contractor is notified and begins mobilizing personnel to Fairbanks Response Base for dispatch to PS09 Delta Response Base.			
Response Actions **Task Force 1** **DRA Recovery**		Delta Response Base responders (5) construct berms and trenches to contain DRA.		Baseline contractor crew of laborers arrives at 1000 from Fairbanks Response Base to assist with the cleanup. Baseline contractor crew is provided with hand tools to recover DRA into 55-gallon drums. Extra drums are brought from Fairbanks Response Base and PS07.	Recovered DRA is stored in containment area pending shipping and disposal. The drums are stored temporarily inside a containment area build using clean fill and a synthetic liner. DRA recovery is complete by 2000 hours.
Recovered Oil Transfer and Storage					Baseline contractor crew completes recovery of DRA by 2000 hours.
Temporary Storage/Ultimate Disposal	Recovered DRA is stored in containment area pending shipping and ultimate disposal. Contaminated soil is stockpiled in a lined area for thermal remediation.				
Wildlife Protection/ Rehabilitation	Not applicable in this spill scenario.				
Shoreline Clean-up Plan	Not applicable to this spill scenario.				

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE PS09.2 PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0 -1 0400-0500								Hour 1-3 0500-0700							Hour 3-6 0700-1000						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security			--	--	--	--	--	--		--	--	--	--	--	--		--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Ground Tracking[5]	DT	1	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--			--	--			--	--	150 lb wheeled extinguisher	--	--	--	--	--	--	Extinguishers	--	--	--	--
Safety	Site Safety and Control[6]	--			--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Wildlife	Wildlife Hazing	Wildlife	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Response Actions	DRA Recovery	TF-1					--	--	Varies	71	4	Loader (1)[8]	Liner hand tools	--	--	Varies	71	4	Loader (1)[8]	Liner hand tools	--	--	Varies	(b) (7) (F), (b)
Source Control	Emergency Repair Response Team	DRA Tank Repair	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			Note[7]	0	1	0					5	1	0					5	1	0				
Mechanical Equipment Total					1	0						1	0						1	0				

TABLE PS09.2 (CONTINUED) PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 6 -12 1000-1600							Hour 12 -24 1600-0400						
			People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
						No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[8]	DT	--	--	--		--	--	--	--	--	--	--	--	--	--
	Ground Tracking[5]	DT	Note5	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	Extinguishers	--	--	--	--	--	--	Extinguishers	--	--	--	--
Safety	Site Safety and Control	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Wildlife	Wildlife Hazing	Wildlife	--	--	--	--	--	--	--	--	--	--	--	--	--	--
On-Scene Comms.	Communications Support	Comms.	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Response Actions	DRA Recovery	TF-1	14	Loader (1)[8]	Liner hand tools	--	--	Varies	71	14	Loader (1)[8]	Liner hand tools	--	--	Varies	(b) (7) (F), (b) (3)
Source Control	Emergency Repair Response Team	DRA Tank Repair	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			15	1	0					15	1	0				
Mechanical Equipment Total				1	0						1	0				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

-- Not arrived on site. May be mobilized or en route.

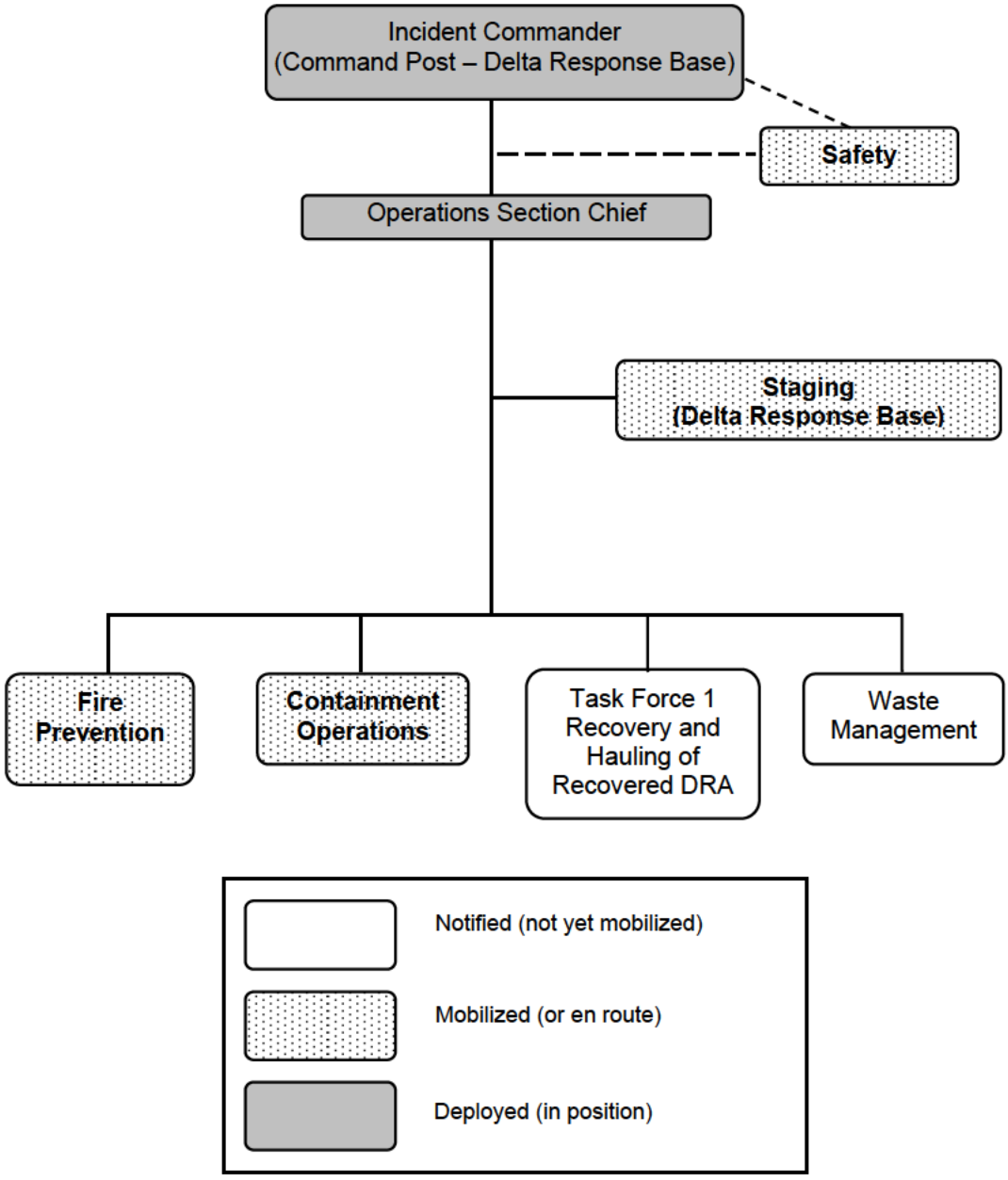


FIGURE PS09.2
PUMP STATION 9 DRAG REDUCING AGENT TANK
SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

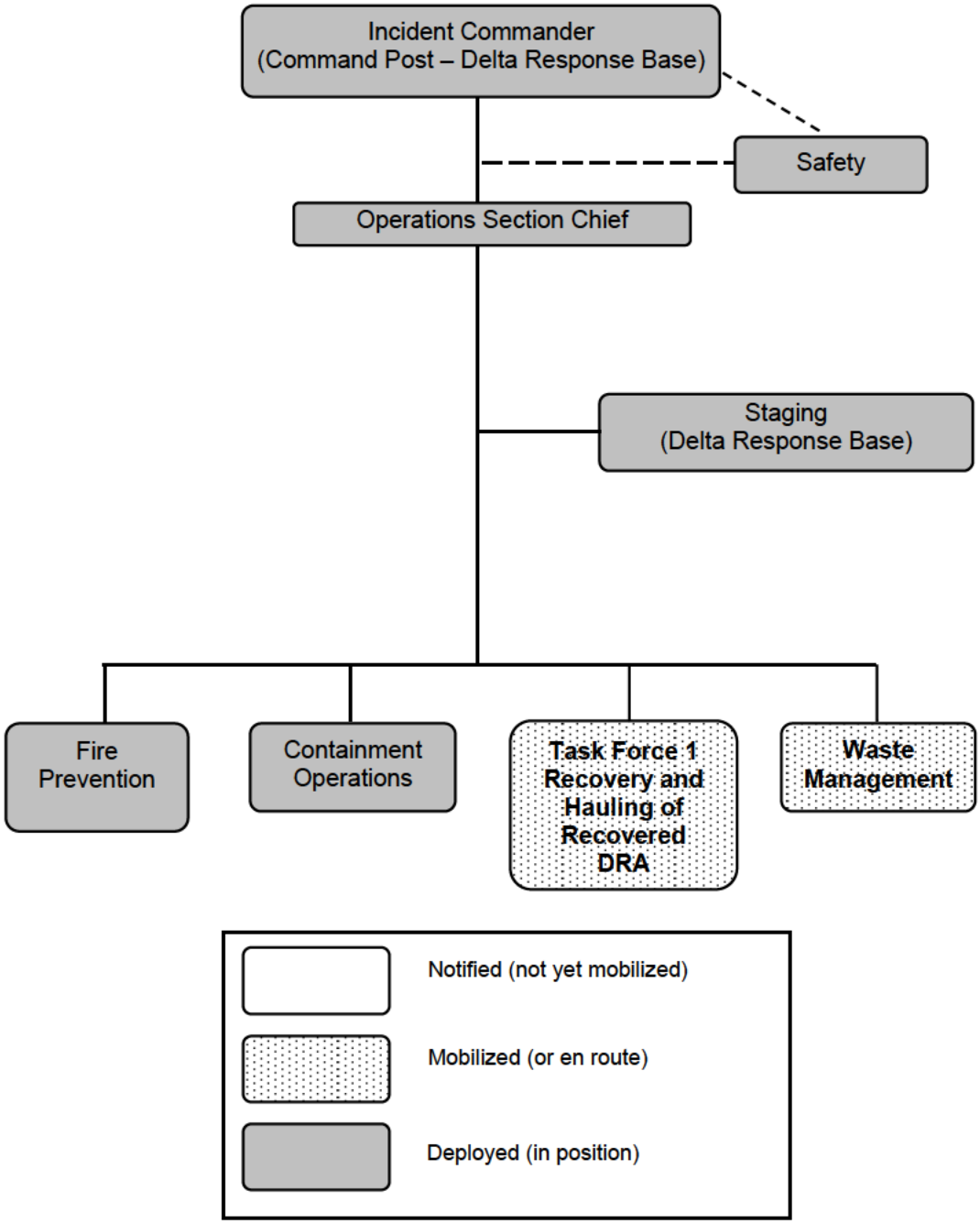


FIGURE PS09.3
PUMP STATION 9 DRAG REDUCING AGENT TANK
SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

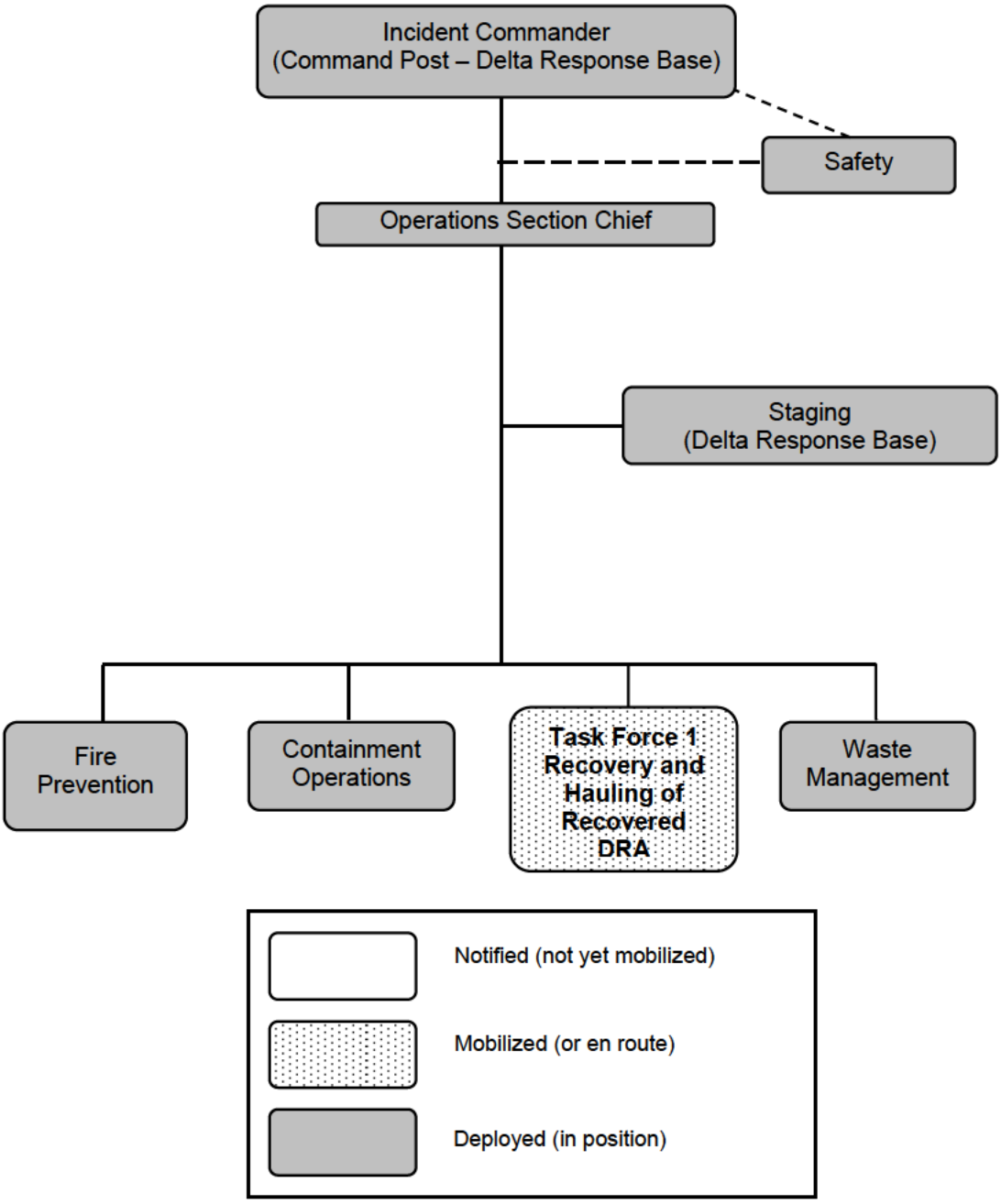


FIGURE PS09.4
PUMP STATION 9 DRAG REDUCING AGENT TANK
SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-6

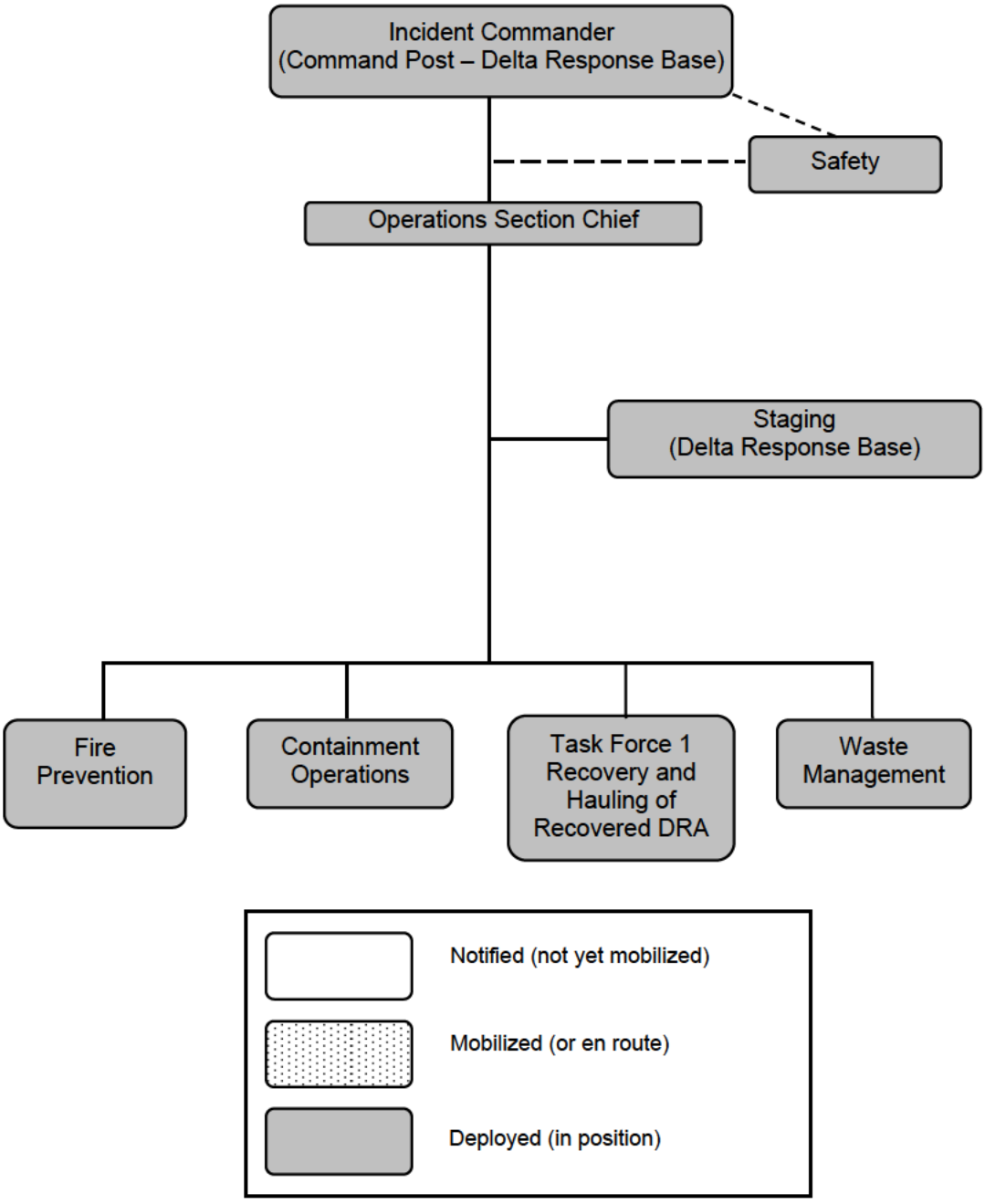


FIGURE PS09.5
PUMP STATION 9 DRAG REDUCING AGENT TANK
SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 6-12

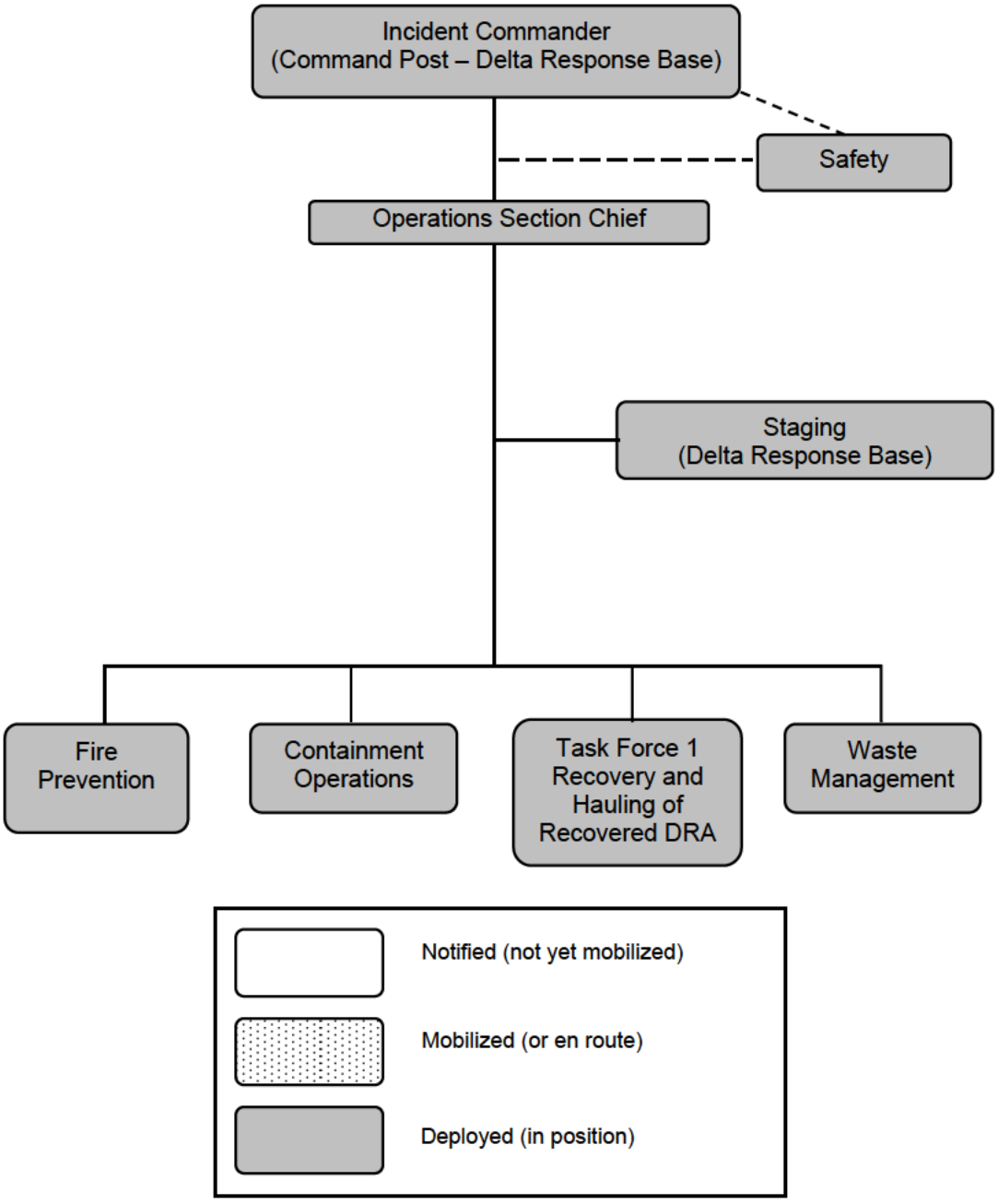


FIGURE PS09.6
PUMP STATION 9 DRAG REDUCING AGENT TANK
SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 12-24

TABLE PS09.3 PUMP STATION 9 DRAG REDUCING AGENT TANK SCENARIO SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

The entire release volume is contained on the pad in the vicinity of the spill. All oil is assumed to be recovered by 2000, 16 hours after the release was identified.

Location	Oil Contained	Emulsification / Total	Cumulative Oil Recovered (Gallons)				
			4 hr	12 hr	24 hr	Total	Remaining
(b) (7)(F), (b) (3)							

Scenario 11. (b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from a 1½-inch diameter puncture in an aboveground pipeline segment.

The scenario is described by seven components:

1. Introductory text

(b) (7)(F), (b) (3)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the site location and a deployment map that shows containment site, task force, and staging area locations (Figures (b) (7)(F), (b) (3), respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario ((b) (7)(F), (b) (3)). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-scene resource tally sheet (b) (7)(F), and resource mobilization tables (b) (7)(F), (b) (3) providing quantities of personnel and equipment, and capacities used in the scenario. The fifth component is the organization structure for the scenario provided as a series of organization charts labeled Figure (b) (7)(F), (b) (3). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site ((b) (7)(F), (b) (3)). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates ((b) (7)(F), (b) (3)).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 11 – (b) (7)(F), (b) (7)(F), (b) (3)	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3)

Source

The leak occurs in a section of aboveground pipe. Crane boom collapses striking the aboveground pipe at (b) (7)(F), (b) (3) .

Environmental Conditions

TIME	0900	**Wind**	2 mph, Out of the East
SEASON	November 3	**Seas**	N/A
SNOW/ICE COVERAGE	2 inches of snow ½ inch of ice on Dry Creek Tundra is partially frozen	**Temperature**	28ºF
VISIBILITY	No Precipitation	**Tide/Current**	N/A

Environmental Considerations – Dry Creek, Segment 1

Caribou are known to winter in the area. There is a big game animal crossing at (b) (7)(F), (b) (3) is considered an anadromous fish stream downstream of AR 22-APL/AMS-(P). Lakes, ponds, streams, and rivers provide important waterfowl nesting habitat throughout the area. Eagle nest sites are located along the Copper River approximately 3 miles east of the hypothetical release point. The area is also a reported subsistence plant harvest area (b) (7)(F), (b) (3) Site is located at Richardson Highway (b) (7)(F), (b) (3) six miles from the hypothetical release point.

Assumptions

1. By 0916 hours OCC has completed shutdown of the pipeline.
2. Closure of remote gate valves (RGV) 103 and RGV 104 takes 8 minutes.
3. The rupture continues to release oil as the pressure in the pipeline relieves.
4. The Fairbanks Initial Response Team and their equipment mobilize out of Fairbanks Response Base and arrive on-site at T + 10.5 hours.

SCENARIO 11 – (b) (7)(F), (b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference	Tactics	Equipment
Volume 3, Section 4.1.1 and 4.3.3	Establishment of containment at CS10-19 will be by diversionary boom. Recovery of spilled oil will be by use of a skimmer, portable oil containers.	(b) (7)(F), (b) (3) [redacted]
Volume 3, Section 4.3.3	Containment of oil at the spill site will be by construction of a catch basin. Recovery of oil will be by the use of multiple oil skimmers, vacuum trucks and portable oil storage containers.	

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (b) (7)(F), (b) (3) [redacted] Timeline Matrix).

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. OCC shuts in the pipeline, closing RGV 103 and RGV 104. The closure time on both valves is 8 minutes. By 0916 hours OCC has completed shutdown of the pipeline.
2. The contractor work crew at the site turns off the crane and retreats from the site with their remaining vehicles. They report to the Glennallen Response Base where they fill out an accident investigation report.
3. Security is dispatched from PS11 to control access at AR 23 APL-1A and AE 22 APL-1.
4. The Glennallen Response Base Response Team is mobilized and requested to deploy containment and recovery equipment at containment site CS10-19 and spill site (TF-1 and TF-2, respectively).
5. The Delta Response Base responders (6) are mobilized and requested to report to mobilize and establish containment and recovery at CS 10-19 (TF-3)
6. Eight (8) Ship Escort/Response Vessel System (SERVS) personnel (6-TCC and 2-APSC) are mobilized to support TF-1 & TF-2.
7. The Fairbanks Initial Response Team is mobilized out of Fairbanks Response Base to install a 48-inch Plidco Sleeve. (TF-4)

   Estimated time of arrival (ETA) of the repair crew equipment from Fairbanks is 10.5 hours. Upon getting their equipment mobilized, the team members are ordered to get some rest before they are flown by charter aircraft to Glennallen, approximately two hours prior to their equipment arriving.
8. Baseline contractor is requested to mobilize a night shift of 25 people to report to Glennallen Response Base at 1900 hours.
9. The regional OC assumes the position of Initial Incident Commander and the Glennallen Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Fairbanks Emergency Operations Center is set up.

SCENARIO 11 – (b) (7)(F), (b) (7)(F), (b) (3)

Oil Trajectory

Oil is spraying into the air and onto the pad and surrounding tundra. The oil flows off both sides of the right-of-way (ROW) and is contained naturally by small ponds in the general vicinity of the work pad. The hot crude oil melts the ½-inch layer of ice and snow cover on top of the ponds.

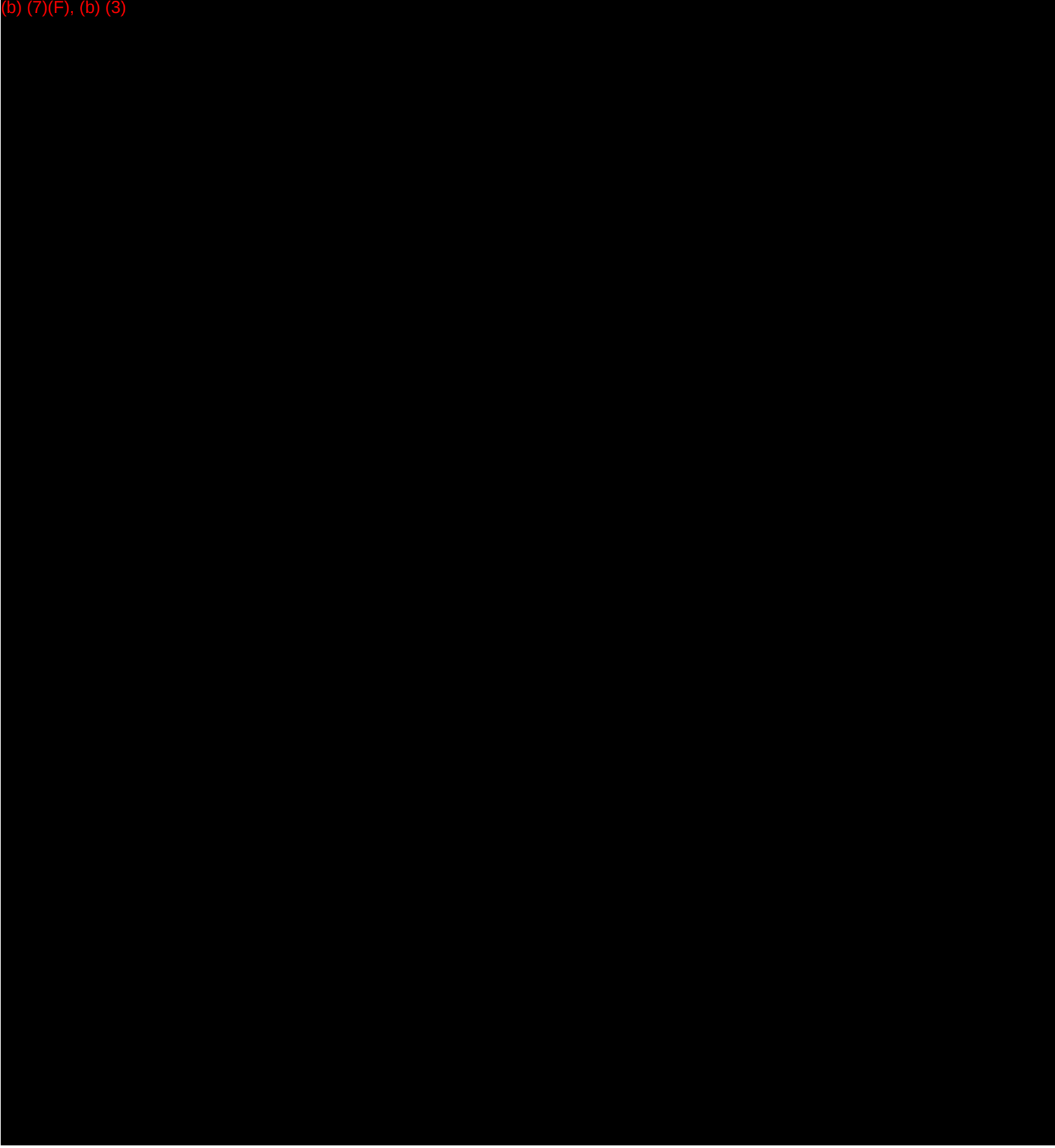
The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking will be done by air, on the ground, or both.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In any actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an on-going evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment",* or other tactics determined by Operations to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of clean-up required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any clean-up activity is underway.

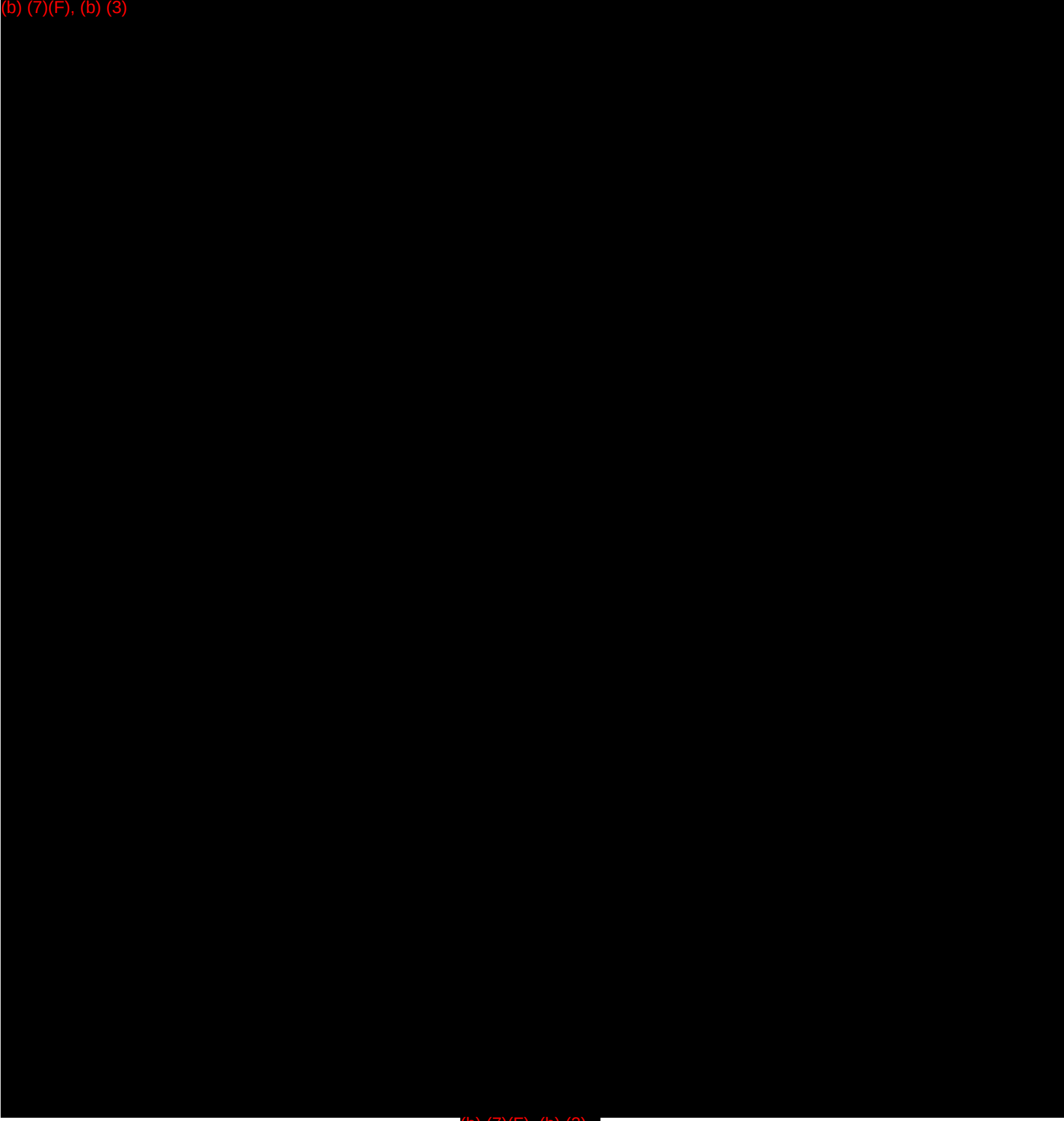
(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

SCENARIO MAP

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

MAP

(b) (7)(F), (b) (3) [redacted] **SCENARIO TIMELINE MATRIX**

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0900-1000)	Hour 1-3 Day 1 (1000-1300)	Hour 3-5 Day 1 (1300-1500)	Hour 5-8 Day 1 (1500-1800)	Night Shift (Hour 8-20) Day 1 (1800-2400); Day 2 (0000-0600)
Situation/Status • **Weather** • **Environmental**	November 3. Winds out of the east at 2 mph. Temperature 28ºF. 2 inches of snow, ½ inch of ice on Dry Creek, and the Tundra is partially frozen. No precipitation. Oil is spraying into the air and onto the pad and surrounding tundra. The oil flows off both sides of the right-of-way (ROW) and is contained naturally by small ponds in the general vicinity of the workpad. The hot crude oil melts the ½" layer of ice and snow cover on top of the pond.	When the pipeline is shut in by OCC, RGV 103 and RGV 104 isolate the leak. The rupture continues to release oil as the pressure in the pipeline relieves.			
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Site Security: Safety, site control, surveillance	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, develop and implement leading edge tracking. Protect life safety. Security is dispatched from the Glennallen Response Base to control access at AR 23 APL-1A and AR 22 APL-1			
	Restrict the spread of spilled oil on land.	Mobilize Response Teams and oil spill response trailer. Deploy containment boom. Contain as near to pipeline as possible. Track oil movements.			
	Implement recovery operations.	Deploy TFs, mobilize resources to maximize recovery.			
	Protect sensitive areas and wildlife.				
	Agency and stakeholder notification.	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.			
Fire Prevention, Control, and Safety		The first responder to arrive on site (TF-1 at T + 2 hours) conducts an initial site safety assessment using air monitoring equipment. This information is radioed back to the Incident Commander and is used to verify that all responders have appropriate PPE before entering the spill site. A safety specialist arrives on-site by T + 3 hours. Upon arrival, the safety specialist conducts a site safety analysis using "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. All work crews are housed in commercial accommodation in the town of Glennallen or at Glennallen Response Base. Equipment and vehicle support are based at Glennallen Response Base.			
		All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL exceeds 20%, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire foam skid, wheeled 150-lb extinguishers, and hand-held extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires using high volume handlines. The primary mission of firefighters is personnel safety and protection. A fire crew from Valdez drives to Glennallen Response Base and mobilizes the Glennallen Response Base fire foam skid that is then placed on standby at the site. A 150-lb wheeled extinguisher is positioned at containment site CS10-19.	The Valdez fire crew arrives with the Glennallen Response Base fire foam skid at T + 3 hours.	The Mobile Command Post arrives with the "Go Team" to provide support services.	

[redacted] CENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0900-1000)	Hour 1-3 Day 1 (1000-1300)	Hour 3-5 Day 1 (1300-1500)	Hour 5-8 Day 1 (1500-1800)	Night Shift (Hour 8-20) Day 1 (1800-2400); Day 2 (0000-0600)
Discharge Tracking	Aerial tracking will be done visually by helicopter. Ground observations are made by containment and recovery operations personnel who will establish the extent of spread of the spilled oil. The frequency of oil trajectory observations will be almost continuous during the initial hours of the response. Incident Commander tracks discharge on a situation status map.	Tracking reports are made to the Incident Command Center via radio on an hourly basis at least. A responder from TF-2 intermittently goes up in the Glennallen Response Base/PS11 helicopter to conduct aerial surveillance, radios the information to the Ops Section Chief, and rejoins TF-2.	Aerial tracking is done visually by helicopter. On-ground observations are made by containment and recovery task force personnel who establish the extent of spread of the spilled oil. As the containment and recovery operations become established and the risk of spread becomes reduced, less frequent reports are provided.		
Protection of Environmentally Sensitive Areas (ESAs)	Caribou are known to winter in the area. There is a big game animal crossing at [redacted]. Dry Creek is considered an anadromous fish stream downstream of AR 22-APL/AMS-(P). Lakes, ponds, streams, and rivers provide important waterfowl nesting habitat throughout the area. Eagle nest sites are located along the Copper River approximately 3 miles east of the hypothetical release point. The area is also a reported subsistence plant harvest area. [redacted] is located at Richardson Highway [redacted], approximately six miles from the hypothetical release point. ESAs within spill path are identified and response tactics identified to minimize impacts. ESAs outside of spill path (on land) are identified and travel routes are established to reduce impacts. Locations of ESAs are communicated in ICS 201 and 204's as well as various briefings.				
Response Actions	The contractor work crew at the site turn off the crane and retreat from the site with their remaining vehicles, and the contractor crew foreman notifies Glennallen Response Base Security that a crane boom has collapsed, striking the aboveground pipe and puncturing a 1 ½-inch hole at the 11 o'clock position. Glennallen Response Base Security notifies the RBS of the incident. The RBS notifies OCC to shut in the pipeline and close remote gate valves (RGVs) upstream and downstream of [redacted] OCC shuts in the pipeline, closing RGV 103 and RGV 104. The closure time on both valves is 8 minutes. By 0916 hours OCC has completed shutdown of the pipeline.	OCC notifies the following State and Federal Agencies: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Containment and recovery task force personnel submit tracking reports to the Incident Command Center via radio on an hourly basis. The response areas are on flat terrain and within 3 miles of the Gakona Communication Tower. Command and control communications will take place over handheld and vehicle radios. Portable radio repeater sets will not be needed. Containment and recovery task force personnel submit tracking reports to the Incident Command Center via radio on an hourly basis.			The 25-person baseline contractor work crew arrives at the Glennallen Response Base at T + 10 hours. The crew provides labor for the night shifts.
	The OC assumes the position of Initial Incident Commander and the Glennallen Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Fairbanks Emergency Operations Center is set up. The Incident Commander contacts the Glennallen Response Base response team and requests a two (2) 5-person response teams to this incident. One team (TF 1) is to respond with the vac truck, front end loader and oil spill response trailers to the incident location at PLMP 676. The second 5-person team is requested to bring one of the Glennallen Response Base oil spill trailers from the Glennallen Response Base and respond to containment site CS10-19 and begin collection and recovery efforts. The Delta Response Base responders (6) are requested to report to mobilize (2) Vac Trucks and a response trailer to establish containment and recovery at an CS 10-19 (TF-3) Ship Escort/Response Vessel System (SERVS) is contacted and notified to respond with a 8-person crew and 2 vacuum trucks to work in TF 1.	The response areas are on flat terrain and within 3 miles of the Gakona Communication Tower. Command and control communications will take place over handheld and vehicle radios. Portable radio repeater sets will not be needed.			

[redacted] SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0900-1000)	Hour 1-3 Day 1 (1000-1300)	Hour 3-5 Day 1 (1300-1500)	Hour 5-8 Day 1 (1500-1800)	Night Shift (Hour 8-20) Day 1 (1800-2400); Day 2 (0000-0600)
Response Actions (Continued)	A Fire/Safety Officer is mobilized to the spill site. The Fairbanks Initial Response Team is mobilized out of Fairbanks with source control and repair equipment to repair the failed section of pipe with a 48-inch Plidco Sleeve. Estimated time of arrival is T + 10.5 hours. Baseline contractor is requested to mobilize a night shift of 25 people to report to the Glennallen Response Base at 1900 hours.				
Task Force 1 **Establish Containment and Recovery at Pipeline Spill Site**	A 5-person crew (TF-1) mobilizes from the Glennallen Response Base with equipment shown in Table [redacted]4 to respond to the incident.	Glennallen Response Base TF-1 arrives on site approximately two hours after the start of the spill. After conducting an initial site safety assessment and establishing decontamination, the crew initiates their response. With the pipeline shut in, oil is no longer coming out of the hole under high pressure. Using oil containment boom, they block the outlets of several small ponds that are naturally trapping oil on both the east and west side of the pipe. A 3000 gallon fold-a-tank is erected under the pipeline to catch oil that continues to ooze from the rupture. Skimming systems are established in the ponds and oil is recovered into temporary tankage using a Elastec TDS 118G Drum skimmer, (2) Lamor MiniMax 12 brush skimmers and (2) Rope Mops. skimmer with derated recovery capacities of 20 bph, 16 bph and 10 bph, respectively.	At T + 3 hours the SERVS crew (6 TCC and 2 APSC SERVS) personnel arrive and assigned to TF 1 to assist in recovery operations. Recovered oil is transported to Valdez for injection into the crude storage tanks. Three vac trucks are used to make round trips to Valdez and off-load every six hours. An additional two vac trucks are requested from the Delta Response Base and PS10. These arrive on site at T + 4 hours and assist in the transport of recovered oil.		Baseline contractor is requested to mobilize a night shift of 25 people to report to Glennallen Response Base at 1900 hours. Fifteen night shift responders are assigned to continue recovery at the spill site.
Task Force 2 **Establish Containment and Recovery at Pipeline Spill Site**	A 5-person crew (TF-2) mobilizes from the Glennallen Response Base with equipment shown in Table [redacted] to respond to the incident.	The 5-person Glennallen Response Base/PS09 crew (TF-2) arrives on-site at T + 2 hours and are assigned to implement containment and recovery tactics at CS 10-19 on dry Creek. TF-2 utilizes a Mega-Secur water dam, 500 feet of containment boom, and an Elastec TDS 118G Drum Skimmer derated at 20 bph to accomplish this tactic.			Five (5) night shift responders are assigned to continue recovery maintain boom at CS 10-19.
Task Force 3 **Establish Containment and Recovery at Pipeline Spill Site**		The 6-person Delta Response Base/PS09 crew (TF-3) arrives on-site at T + 4 hours and are assigned to implement containment and recovery tactics at CS 10-19 on dry Creek. TF -3 utilizes a Mega-Secure water dam, 500 feet of containment boom, and an Elastec TDS 118G Drum Skimmer derated at 20 bph to accomplish this tactic.			Five (5) night shift responders are assigned to maintain boom at CS 10-18.
Task Force 4 **Repair the Pipeline**	The Fairbanks Initial Response Team is mobilized out of Fairbanks Response Base with source control and repair equipment to repair the failed section of pipe with a 48-inch Plidco sleeve. Estimated time of arrival is T + 10.5 hours.		A crane is requested from Valdez.	TF-4 is flown by charter aircraft to Glennallen Response Base at T + 8.5 (approximately 2 hours prior to their equipment arriving).	TF-4 arrives from Fairbanks Response Base at T + 10.5 hours and begins preparations for repair. The crane arrives from Valdez and uprights the overturned crane. Once the overturned crane has been moved off of the pipe, it is moved down the workpad to the north onto a prepared containment area where all the oil on the crane is removed with a steam cleaner. With the crane safely removed, the catch basin under the pipeline is emptied of oil to minimize the hazard to the repair crew. The repair crew cuts off the insulation and installs a 48" Plidco clamp. In total, this work takes 12 hours and is completed at T + 22.5 hours.
Wildlife Protection – Rehabilitation	An EC mobilizes to the site.	The Environment Unit places CCI on standby to provide wildlife hazers and to mobilize the wildlife treatment center from Fairbanks if necessary.		The EC arrives on site. The EC determines that the risk of wildlife entering the spill site is negligible and recommends that no wildlife hazers be mobilized to the site.	

[redacted] SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 21) Day 2 (0600) +
Reevaluation of Objectives	The On-Scene Incident Commander, the Federal On-Scene Coordinator, and the State On-Scene Coordinator will continuously monitor the response organization's performance in achieving the incident objectives. Adjustments will be made as needed throughout the course of the response. Once the source of the spill is secured, the spread of oil contained, and recovery operations well-established, an additional focus will be placed on removal of oil from shorelines and the ground. Consideration may be given to leaving oil in place temporarily until the ground, ponds, and streams freeze up. This may reduce the damage to shorelines and tundra/swampy areas.
Waste Disposal	Oiled gravel on the pad is excavated and removed. A temporary storage site is constructed at Glennallen Response Base. Once the gross oil has been removed, an impoundment area is constructed using sandbags to contain any oil that has not been recovered. In the spring, once the snow begins to melt, oil that has been mobilized by the melting water is recovered using skimmers. A plan is developed for long-term remediation of the site.
Task Force 3 **Repair the Pipeline**	Repairs to the pipeline are completed at T + 22.5 hours.
Shoreline Clean-up	A shoreline cleanup plan for the lakes is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. These efforts are cleared and approved by the State On-Scene Coordinator. The shoreline types in the potentially impacted areas are assessed and are found to include tundra mat and peat, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold water low-pressure wash with cold water deluge and recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are used to recover deeper pools of oil when possible. Oiled peat slurries may be removed by small loaders and transported to stable areas for cleaning. Peat outcrops are raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Shoreline cleanup operations start at T + 72 hours. Over a period of about one week, the shoreline cleanup crews recover about one-half of the oil volume estimated onshore a following completion of initial recovery efforts. The initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

[redacted] SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 0900-1000								Hour 1-3 1000-1200							Hour 3-5 1200-1400						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage[3] No.	Storage[3] Capacity (bbl)	People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage[3] No.	Storage[3] Capacity (bbl)	People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage[3] No.	Storage[3] Capacity (bbl)
Security	Site Control	Security	--	2	--	--	--	--	--	--	2	--	Glennallen Response Base	--	--	--	--	2	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--	--	--	--	--	--	--	--	1 helicopter (1)	--	--	--	--	--	--	1 helicopter (1)	--	--	--	--
	Ground Tracking[5]	DT	--	Note 5	--	--	--	--	--	--	Note 5	--	--	--	--	--	--	Note 5	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	1 Glennallen Response Base fire foam skid (2)	--	--	--	--
Safety	Site Safety and Control[6]	--	--	--	--	--	--	--	--	--	1	--	--	--	[redacted]	--	[redacted]	1	--	--	--	--	--	--
Containment and Recovery	Containment and Recovery at Pipeline Spill Site	TF-1 Establish Containment and Recovery at Pipeline Spill Site	--	--	--	--	--	--	--	--	5	Vac truck (1)[8] 930-forklift (1)[8] Oil spill response trailer	3,000 gallon tank (3) 1,000 gallon tank (2) CSI Rope Mops Elastec TDS 118g skimmer (2) Lamor MiniMax 12 skimmer	6	[redacted]	4	[redacted]	15	5 Vac trucks (5)[8] 930-forklift (1)[8] Oil spill response trailer	3,000 gallon tank (3) 1,000 gallon tank (2) CSI Rope Mops Elastec TDS 118g skimmer (2) Lamor MiniMax 12 skimmer	10	[redacted]	Varies	[redacted]
	Containment and Recovery at Dry Creek CS10-19	TF-2 Establish Containment and Recovery at CS10-19	--	--	--	--	--	--	--	--	5	Oil spill response trailer Vac truck (1)[8]	Elastec TDS 118g skimmer 150– b wheeled fire extinguisher Containment boom (1,000 ft)	2		3		5	Vac truck (1)[8] Oil spill response trailer	Elastec TDS 118g skimmer 150– b wheeled fire extinguisher Containment boom (1,000 ft)	2		3	
Containment and Recovery (continued)	Containment and Recovery at Dry Creek CS10-19	TF-3 Establish Containment and Recovery at CS10-19	--	--	--	--	--	--	--	--	--			--		--	--	5	Oil spill response trailer	Elastec TDS 118g skimmer Containment boom (500 ft) Mega-Secur water dam (3) 1,000 gallon tank	1		3	
	Repair the Pipeline	TF-4 Repair the Pipeline	--	--	--	--	--	--	--	--	--	930-forklift (1)	185 CFM air compressor	--	--	--	--	--	930-forklift (1)	185 CFM air compressor	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--	Handheld and vehicle radios	--	--	--	--	--	--	Handheld and vehicle radios	--	--	--	--	--	--	Handheld and vehicle radios	--	--	--	--

[redacted] **CENARIO ON-SITE RESOURCE TALLY**

Resource Description	Tactics	Task Force	Hour 0-1 0900-1000								Hour 1-3 1000-1200							Hour 3-5 1200-1400						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Personnel Total			Note[7]	2	1	--					18	3	1					23	8	3				
Mechanical Equipment Total					1	--						3	8						8	9				

[redacted] CONTINUED) [redacted] CENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-8 1400-1800								Hour 8-20 1800-0600							Hour 20+ 0600+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No	Capacity (bbl)
Security	Site Control	Security	2	2	--	--	--	--	--	--	2	--	--	--	--	--	--	2	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--	1 helicopter (1)	--	--	--	--		--	1 helicopter (1)	--	--	--	--		--	1 helicopter (1)	--	--	--	--
	Ground Tracking[5]	DT	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	--	1 Glennallen Response Base fire foam skid (2)	--	--	--	--		--	1 Glennallen Response Base fire foam skid (2)	--	--	--	--	--	--	1 Glennallen Response Base fire foam skid (2)	--	--	--	--
Safety	Site Safety and Control[6]	--	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
	Containment and Recovery at Pipeline Spill Site	TF-1 Establish Containment and Recovery at Pipeline Spill Site	--	15	Vac truck (5)[8] 930-forklift (1)[8] Oil spill response trailer	3,000 gallon tank (2) 10,000 gallon bladder (2) CSI Rope Mops Elastec TDS 118g skimmer (2) Lamor MiniMax 12 skimmer	6	[redacted]	3	[redacted]	15	Vac truck (5)[8] 930-forklift (1)[8] Oil spill response trailer	3,000 gallon tank (2) 10,000 gallon bladder (2) CSI Rope Mops Elastec TDS 118g skimmer (2) Lamor MiniMax 12 skimmer	6	[redacted]	3	[redacted]	15	5 Vac trucks (5)[8] 930-forklift Oil spill response trailer	3,000 gallon tank (3) 1,000 gallon tank (2) 10,000 gallon bladder (3) 1,000 gallon tank (2) CSI Rope Mops Elastec TDS 118g skimmer (2) Lamor MiniMax 12 skimmer	10	[redacted]	6	[redacted]
	Containment and Recovery at Dry Creek CS10-19	TF-2 Establish Containment and Recovery at CS10-19	--	5	Oil spill response trailer Vac truck (1)[8]	Elastec TDS 118g skimmer 150–lb wheeled fire extinguisher Containment boom (1,000 ft) (3) 1,000 gallon tank	2	[redacted]	3s	[redacted]	5	Oil spill response trailer Vac truck (1)[8]	Elastec TDS 118g skimmer 150–lb wheeled fire extinguisher Containment boom (1,000 ft) (3) 1,000 gallon tank	2	[redacted]	3s	[redacted]	5	Vac truck (1)[8] Oil spill response trailer	Elastec TDS 118g skimmer 150–lb wheeled fire extinguisher Containment boom (1,000 ft) (3) 1,000 gallon tank	2	[redacted]	3	[redacted]

[redacted] ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-8 1400-1800								Hour 8-20 1800-0600								Hour 20+ 0600+							
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]			
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No	Capacity (bbl)		
Safety (continued)	Containment and Recovery at Dry Creek CS 10-19	TF-3 Establish Containment and Recovery at CS10-19	--	5	Oil spill response trailer	Elastec TDS 118g skimmer Containment boom (500 ft) Mega-Secur water dam (3) 1,000 gallon tank	1	[redacted]	3	[redacted]	5	Oil spill response trailer	Elastec TDS 118g skimmer Containment boom (500 ft) Mega-Secur water dam (3) 1,000 gallon tank	1	[redacted]	3s	71	5	Oil spill response trailer	Elastec TDS 118g skimmer Containment boom (500 ft) Mega-Secur water dam (3) 1,000 gallon tank	1	[redacted]	3	[redacted]
	Repair the Pipeline	TF-4 Repair the Pipeline	--	--	Crane (40 ton) (1) 930-fork lift (1)	185 air compressor 100-ft x 100-ft reinforced liner 200-ft of 12-in x 12-in timbers	--	--	--	--	6	Crane (40 ton) (1) 930-fork lift (1) 185 air compressor	100-ft x 100-ft reinforced liner 200-ft of 12-in x 12-in timbers 48-in x 22½-in Plidco clamp 1½-in impact gun rigging package 1-in female to 1½-in male adaptor 1-in drive torque wrench 1-in drive multiplier 1½-in drive multiplier 37/8-in knocker wrench 1 box of half round bastard files 37/8-in shaved socket 1½-in drive	--	--	--	--	6	Crane (40 ton) (1)[8] 930-fork lift (1)[8] 185-air compressor	100-ft x 100-ft reinforced liner 200-ft of 12-in x 12-in timbers 48in x 22½-in Plidco clamp 1½-in impact gun rigging package 1-in female to 1½-in male adaptor 1-in drive torque wrench 1-in drive multiplier 1½-in drive multiplier 37/8-in knocker wrench 1 box of half round bastard files 37/8-in shaved socket 1½-in drive	--	--	--	--
	Additional Resources	Night Shift	--	--	--	--	--	--	--	--	25	--	--	--	--	--	--	25	--	--	--	--	--	--	--

[redacted] SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-8 1400-1800								Hour 8-20 1800-0600							Hour 20+ 0600+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equip (Operators)	Response Equip (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No	Capacity (bbl)
On-Scene Comms.	Communications Support	Comms.	--	Mobile Command Post (12)		Handheld and vehicle radios	--	--	--	--	Mobile Command Post (12)	--	Handheld and vehicle radios	--	--	--	--	Mobile Command Post (12)	--	Handheld and vehicle radios	--	--	--	--
Personnel Total			Note[7]	40	9	3					69	9	3					69	9	3				
Mechanical Equipment Total					9	10						9	10						9	10				

[1] Number of people excludes state or federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

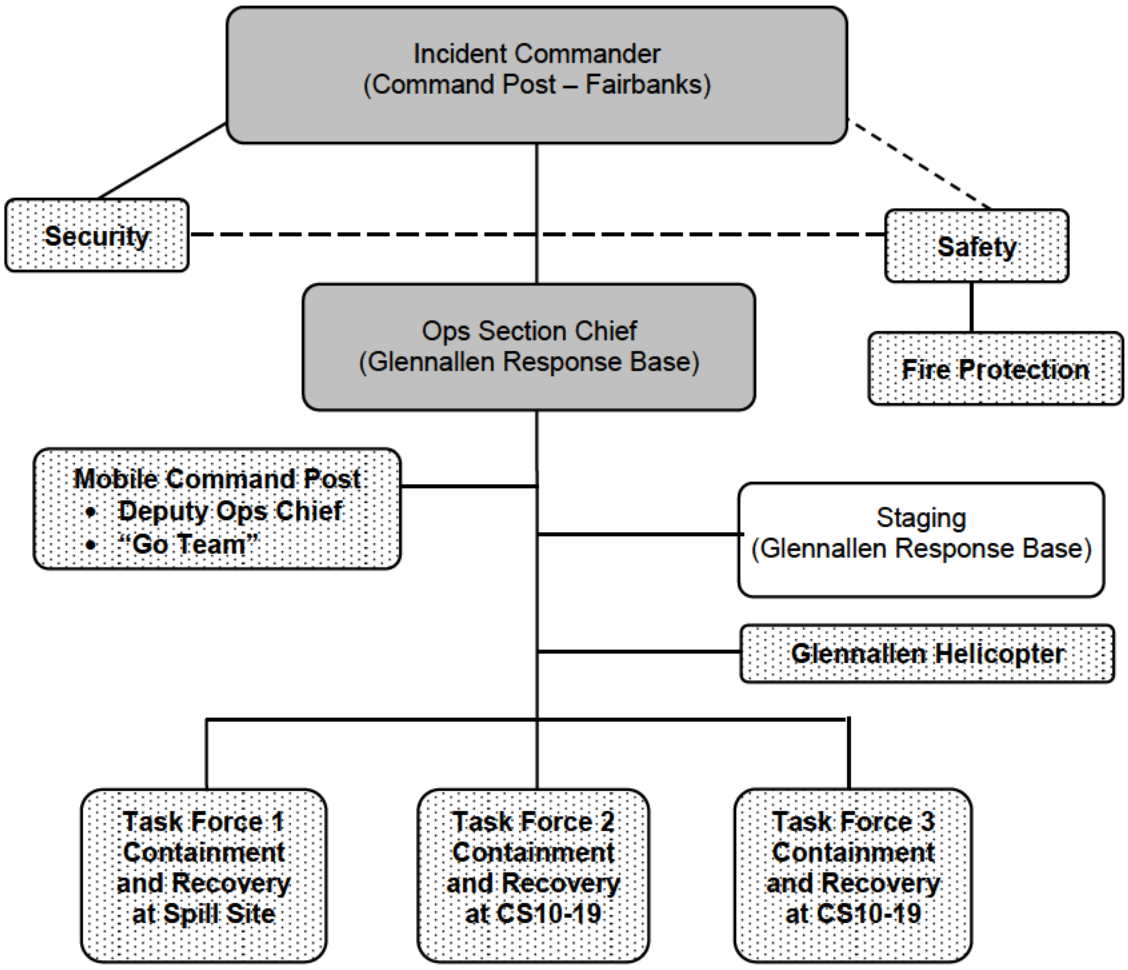
[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

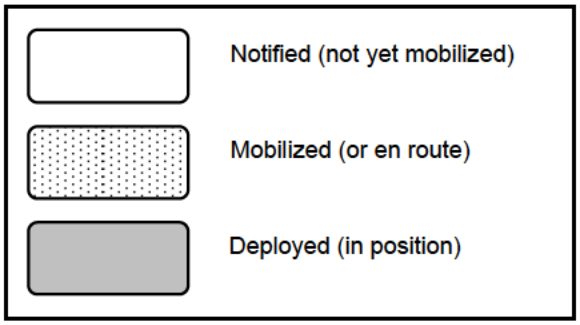
[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

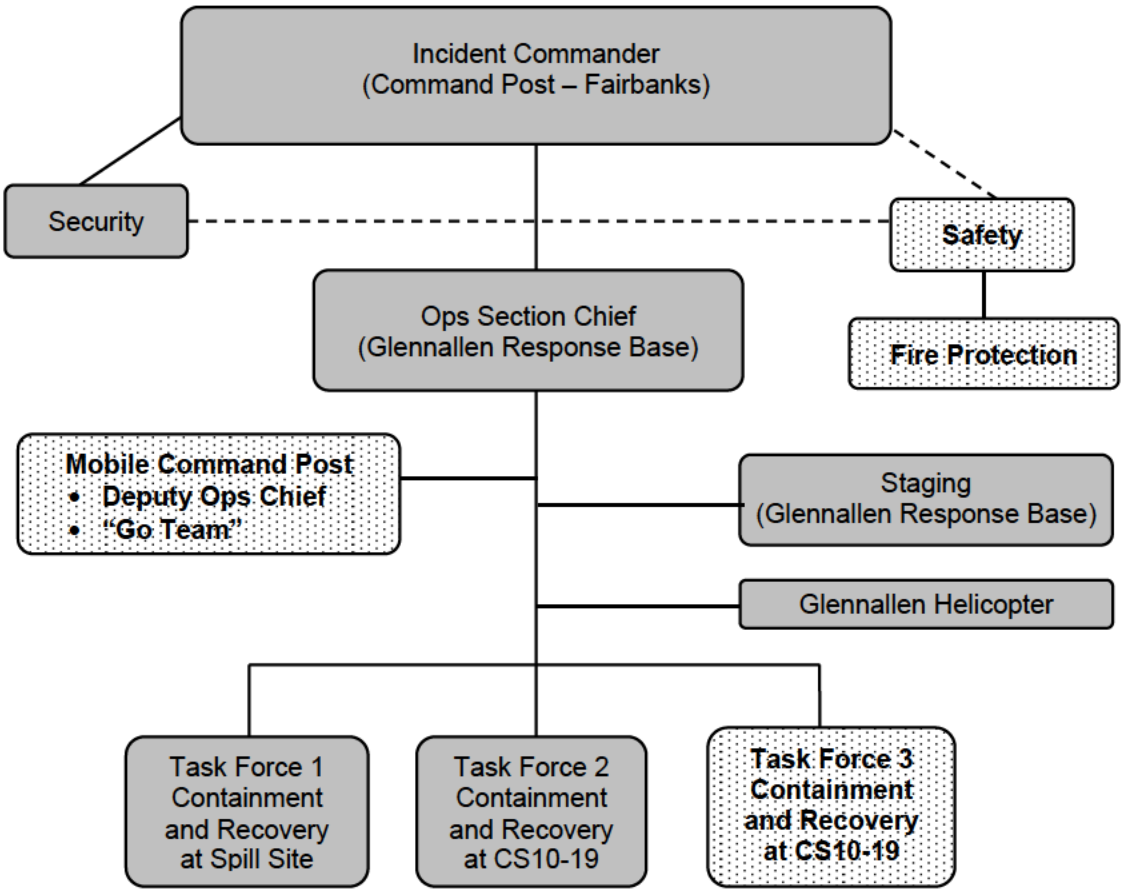


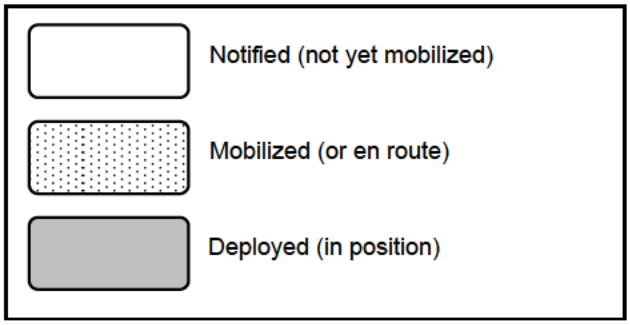


(b) (7)(F), (b) (3)

ANIZATION CHART

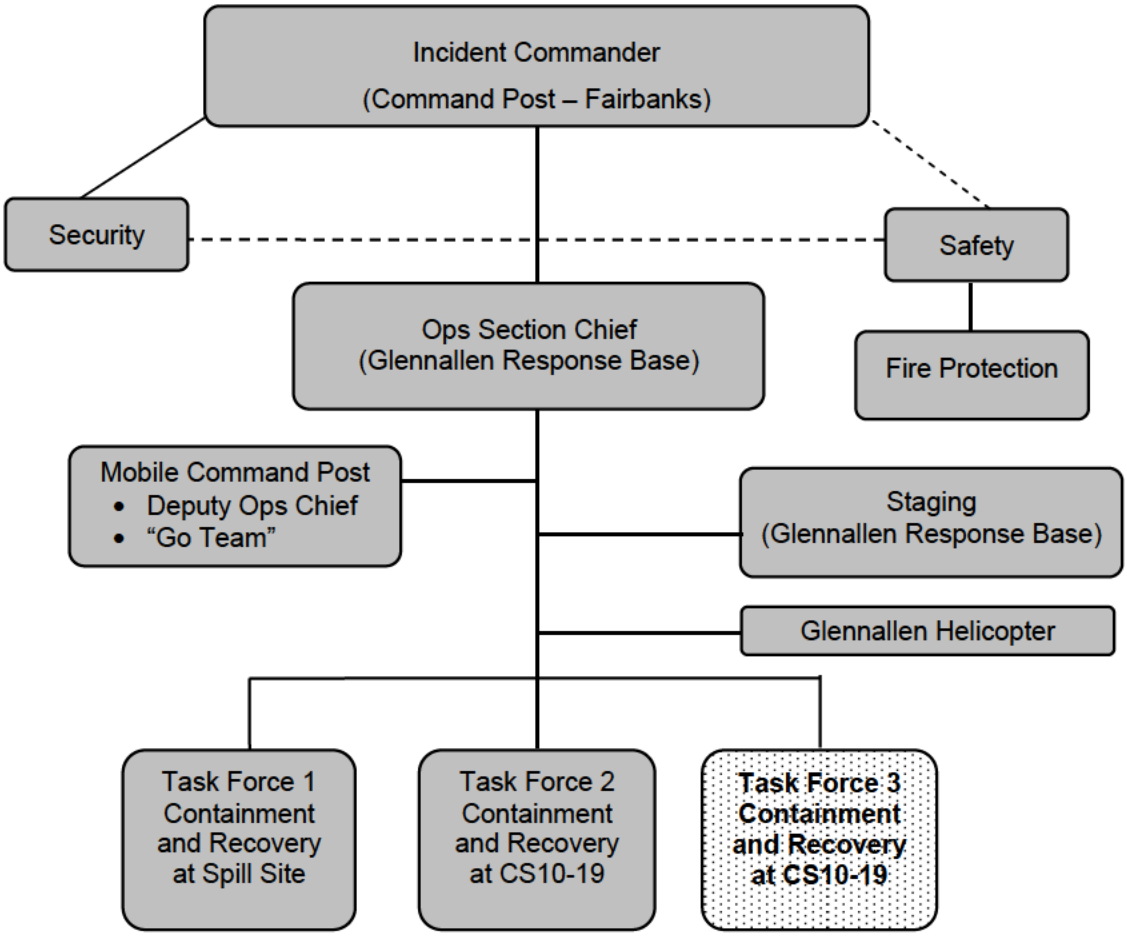
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

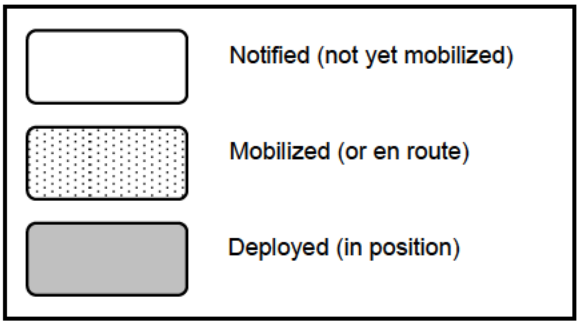




(b) (7)(F), (b) (3)

GANIZATION CHART
OURCES, HOUR 1-3

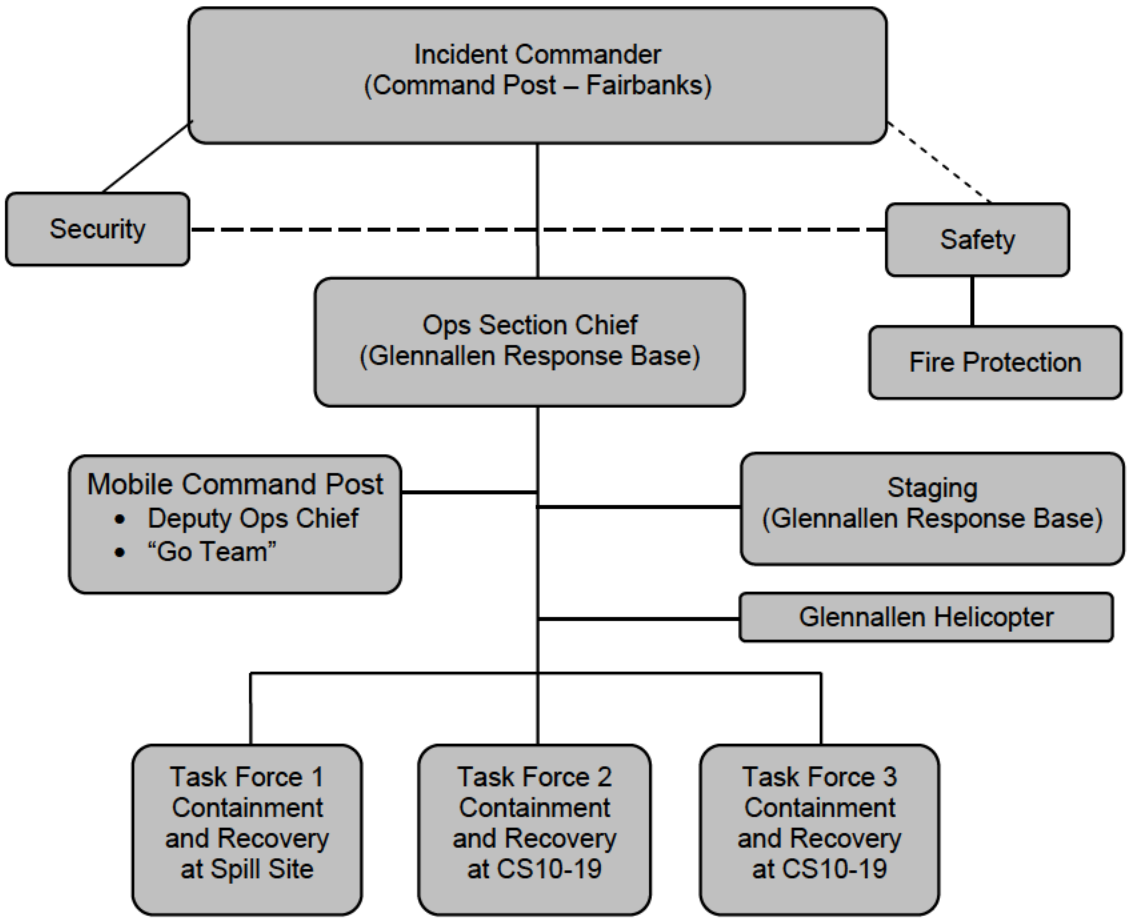


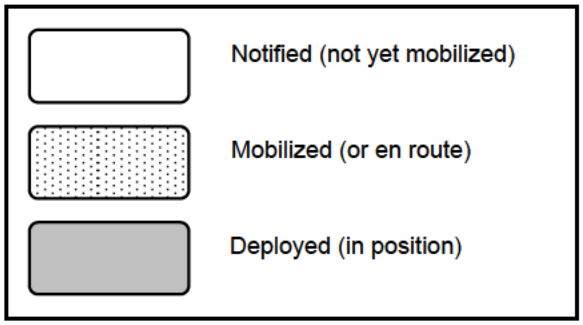


(b) (7)(F), (b) (3)

RGANIZATION CHART

OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-9





(b) (7)(F), (b) (3)

GANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 9+

(b) (7)(F), (b) (3) [redacted]

RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT SPILL SITE

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Glennallen Response Base fire foam skid	Glennallen Response Base	Fire prevention and control	T + 3 hr
Firefighters (2)	Valdez	Labor	T + 3 hr
Baseline contractor 25-person crew	Fairbanks Response Base	Labor – night shift	T + 10 hr
Glennallen Response Base baseline crew (5) (TF-1)	Glennallen Response Base	Labor	T + 2 hr
Oil spill response trailer	Glennallen Response Base	Response equipment	T + 2 hr
Mega-Secur Water Dam	Glennallen Response Base	Water Dam	T + 2 hr
Elastec TD 118G Skimmer	Glennallen Response Base	Recovery	T + 2 hr
(2) CSI Rope Mops	Glennallen Response Base	Recovery	T + 2 hr
(2) Lamor MiniMax 12 skimmers	Glennallen Response Base	Recovery	T + 2 hr
20,000 gallons of storage	Glennallen Response Base	Storage	T + 2 hr
3,000 gallon fold-a-tank	Glennallen Response Base	Storage	T + 2 hr
930 forklift	Glennallen Response Base	Move equipment	T + 2 hr
Vac truck (3)	Valdez	Oil storage and transport	T + 3 hr
SERVS crew (8)	Valdez	Labor	T + 3 hr
Vac truck (2)	Delta Response Base and PS10	Oil storage and transport	T + 4 hr

(b) (7)(F), (b) (3) [redacted]

RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT CS10-19

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Glennallen Response Base Response Team (5) (TF-2)	Glennallen Response Base	Labor	T + 2 hr
Oil spill response trailer	Glennallen Response Base	Initial Response	T + 2 hr
Elastec TD 118G Skimmer	Glennallen Response Base	Recovery operations	T + 2 hr
3,000 gallons of portable storage	Glennallen Response Base	Temporary storage	T + 2 hr
Containment boom (1,000 ft)	Glennallen Response Base	Oil Containment	T + 2 hr
Vac truck (1) operator included in TF-2	Glennallen Response Base	Oil storage and transport	T + 3 hr
150-lb Fire extinguisher	Glennallen Response Base	Fire suppression	T + 2 hr
Helicopter	Glennallen	Discharge tracking	T + 1 hr

(b) (7)(F), (b) (3) [redacted]

RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT CS10-19

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Delta Response Base Response Team (6) (TF-3)	Delta Response Base	Labor	T + 4 hr
Oil spill response trailer	Delta Response Base	Initial Response	T + 4 hr
Elastec TD 118G Skimmer	Delta Response Base	Recovery operations	T + 4 hr
3,000 gallons of portable storage	Delta Response Base	Temporary storage	T + 4 hr
Containment boom (1,000 ft)	Delta Response Base	Oil Containment	T + 4 hr
Mega-Secur water dam	Delta Response Base	Oil Containment	T + 4 hr

(b) (7)(F), (b) (3) [redacted]

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
48-in x 22½-inch Plidco clamp	Fairbanks Response Base	Stopping leak and allowing pipeline to return to operation	T + 10.5 hr
Crane (40 ton)	Valdez	Installation of the clamp	T + 5 hr
930 fork lift	On-site	Moving materials	On-Site
185 CFM Air compressor	PS12	Operation of air driven wrenches	T + 10.5 hr
1 each 1½-inch impact gun	Fairbanks Response Base	Tightening bolts	T + 10.5 hr
1 each rigging package	Fairbanks Response Base	Slinging the clamp	T + 10.5 hr
1 each 1-inch female to 1 each ½-inch male adaptor	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each 1-inch drive torque wrench	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each 1-inch drive multiplier	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each 1½-inch drive multiplier	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each $3^{7}/_{8}$-inch knocker wrench	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each box of half round Bastard files	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each $3^{7}/_{8}$-inch shaved socket 1½-inch drive	Fairbanks Response Base	Special tools for clamp installation	T + 10.5 hr
1 each Welder 3 each Fitters 1 each Operator 2 each Laborers (TF-4)	Fairbanks Response Base	Site fabrication, preparation, and installation	T + 10.5 hr
100-ft x 100-ft reinforced liner	Valdez	Construct catch basin	T + 5 hr
200 feet of 12-inch x 12-inch timbers	Valdez	Construct catch basin	T + 5 hr

(b) (7)(F), (b) (3)

SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in (b) (7)(F), (b) (3) th oil spraying into the air and a grade of about 3% to the east, no oil will travel over land to CS10-19 at Dry Creek. An estimated (b) (7) is retained in the small ponds on either side of the right-of-way. An (b) (7)(F), (b) (3) is retained in the soil and tundra covering approximately 2 acres. The remaining (b) (7)(F), re expected to be retained in the catchment basin constructed on-site. It is assumed that the oil will melt all snow that it contacts, leading to an emulsion rate of 10% for the oil trapped on land. A slightly higher emulsion rate of 15% is expected from oil recovered from the ponds. Excavation and shoreline cleanup is expected to start after T+72 hours and therefore no recovery from these areas is reflected in the table.

Location	Oil Contained (bbls)	Emulsification (%) / Total (bbls)	Cumulative Oil Recovered (bbls)				
			4 hr	12 hr	24 hr	Total	Remaining
(b) (7)(F), (b) (3)							

Scenario 12. Gulkana River

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from a ½-inch diameter bullet hole in an aboveground pipeline segment.

The scenario is described by seven components:

1. Introductory text
2. A scenario map (Figure GULK.1) and a deployment map depicting the site location (Figure GULK.2).
3. Timeline matrix (Table GULK.1)
4. On-site resource tally sheet (Table GULK.2)
5. Response organization charts (Figures GULK.3 through GULK.6)
6. Resource mobilization tables (Tables GULK.3 through GULK.9)
7. Summary of oil fate and estimated recovery (Table GULK.10)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site (Figures GULK.1) and a deployment map (Figure GULK.2) that shows containment site, task force, and staging area locations. The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table GULK.1). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table GULK.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures GULK.4 through GULK.7). The sixth component consists of a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables GULK.3 through GULK.7). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table GULK.8).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 12 – GULKANA RIVER
(b) (7)(F), (b) (3)

Response Type	Amount
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3)

Source

The leak occurs in a section of aboveground pipe at Pipeline (b) (7)(F), (b) (3) due to a bullet hole (½-inch diameter). The oil is escaping from the pipeline at a rate of 145 barrels per hour (bph). The spill has gone undetected for 9 hours.

Environmental Conditions

Time	1330	**Wind**	3 mph, from S
Season	Summer - August	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	61ºF
Visibility	No precipitation	**Tide/Current**	Gulkana River at 2 feet per second (fps)

Environmental Considerations – Gulkana River, Segment 1

(b) (7)(F), (b) (3)
resident species. The river is sensitive to disturbances all year, with the most critical months occurring in May through October. This part of the pipeline right-of-way (ROW) is within a National Conservation Area managed by the Bureau of Land Management (BLM). Big game animal crossing occurs at (b) (7)(F), (b) . Eagle nesting and concentrations occur from 0 to 9 miles west of the pipeline in this area. The village of Gulkana has one groundwater source intake well that is influenced by the Gulkana River.

Assumptions

The Gu kana River Scenario is a highly unlikely scenario because the existing dike would prevent oil from entering the river. For the purpose of demonstrating a response for this river situation, the scenario assumptions are:

1. Oil is escaping from the pipeline at 145 bph. A total of (b) (7)(F), (b) (3)
2. The leak point is nearly at the highest point of the pipeline in this segment.
3. The dike is breached.
4. The Fairbanks Initial Response Team arrives on site at T + 10 hours (T = time of notification, 13:30). It takes 4 hours to install a bullet clamp.
5. Oil is flowing into the Gulkana River.
6. Five containment sites are constructed, one at the spill site and four on the Gu kana River.

SCENARIO 12 – GULKANA RIVER
(b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference	Tactics	Equipment
Volume 3, Sections 4.1.1, 4.3.3	Diversionary and containment booming, skimmers, and portable oil storage tanks will be used for containment and recovery at CS10-17.	Volume 2, Table GULK.3
Volume 3, Sections 4.1.1	Use a D-6 dozer for trenching and berming activities to contain oil at spill site.	Volume 2, Table GULK.4
Volume 3, Sections 4.1.1 and 4.3.3	Use diversionary and containment boom to contain oil at CS10-16. Skimmers, barrel barges and portable storage tanks are used to recover spilled oil.	Volume 2 Table GULK.5

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table GULK.1, Gu kana River Scenario Timeline Matrix).

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. Operations Control Center (OCC) shuts in the pipeline and closes remote gate valves (RGV) in the line segments. RGV 98A and check valve (CKV) 99 isolate the leak.
2. The Glennallen Response Base, RBS assumes the positions of Initial Incident Commander (IIC) and Operations Section Chief. The regional OC arrives from Delta at T + 3 hours and takes over the IIC position. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks.
3. The Glennallen Response Base Response Team is mobilized and requested to deploy containment and recovery equipment at containment site CS10-17 and spill site (TF-1 and Tf-2)
4. The Delta Response Base responders (6) are mobilized and requested to report to RGV 100 to establish containment and recovery at an Area of Opportunity on the Gu kana River (TF-3)
5. The off shift Glennallen Response Base responders (7) are recalled and requested to report to RGV 102 to establish containment and recovery at an Area of Opportunity on the Gulkana River (TF-4)
6. Eight (8) Ship Escort/Response Vessel System (SERVS) personnel (6-TCC and 2-APSC) are mobilized and requested to report CS 10-1 to establish containment and recovery at an CS10-16 (TF-5).
7. The Fairbanks Initial Response Team baseline contractor is mobilized out of Fairbanks Response Base to install a bullet clamp. Estimated time of arrival (ETA) of the repair crew equipment from Fairbanks Response Base is 10 hours. The team members are ordered to get some rest and are flown by charter aircraft to Glennallen approximately 2 hours prior to their equipment arriving. (TF-6)

SCENARIO 12 – GULKANA RIVER
(b) (7)(F), (b) (3)

8. The International Bird Rescue Research Center (IBRRC) out of Berkeley, California, is notified and requested to mobilize a full scale hazing operation as well as capture and stabilization operation. This includes making the Anchorage wildlife facility operational (TF-7)
9. The Safety Officer and Environmental Coordinator (EC) mobilize to the site. The EC will mobilize an Environmental Contractor to begin routine monitoring of the (b) (7)(F), (b) (3)
10. Based on the threat of sabotage, a complete reconnaissance of the pipeline is ordered. Priority is given to the area around the Gulkana River.
11. Baseline contractor is requested to mobilize a night shift of 25 people to report to the staging area at 1900 hours.
12. The SERVS/Valdez and Fairbanks Response Based helicopters are mobilized to support Task Force 3 & 4.
13. The Glennallen Response Base/PS11 Helicopter is mobilized to track movement of the oil.

Oil Trajectory

Oil is spraying into the air and onto the pad and surrounding tundra, west of the pipe. The oil is flowing into the Gulkana River. The river is moving at 2 feet per second. The initial flow rate is 145 bph. Upon shut in of the pipeline, the pressure and flow rate are reduced significantly.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment*", or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and resources are affected, and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

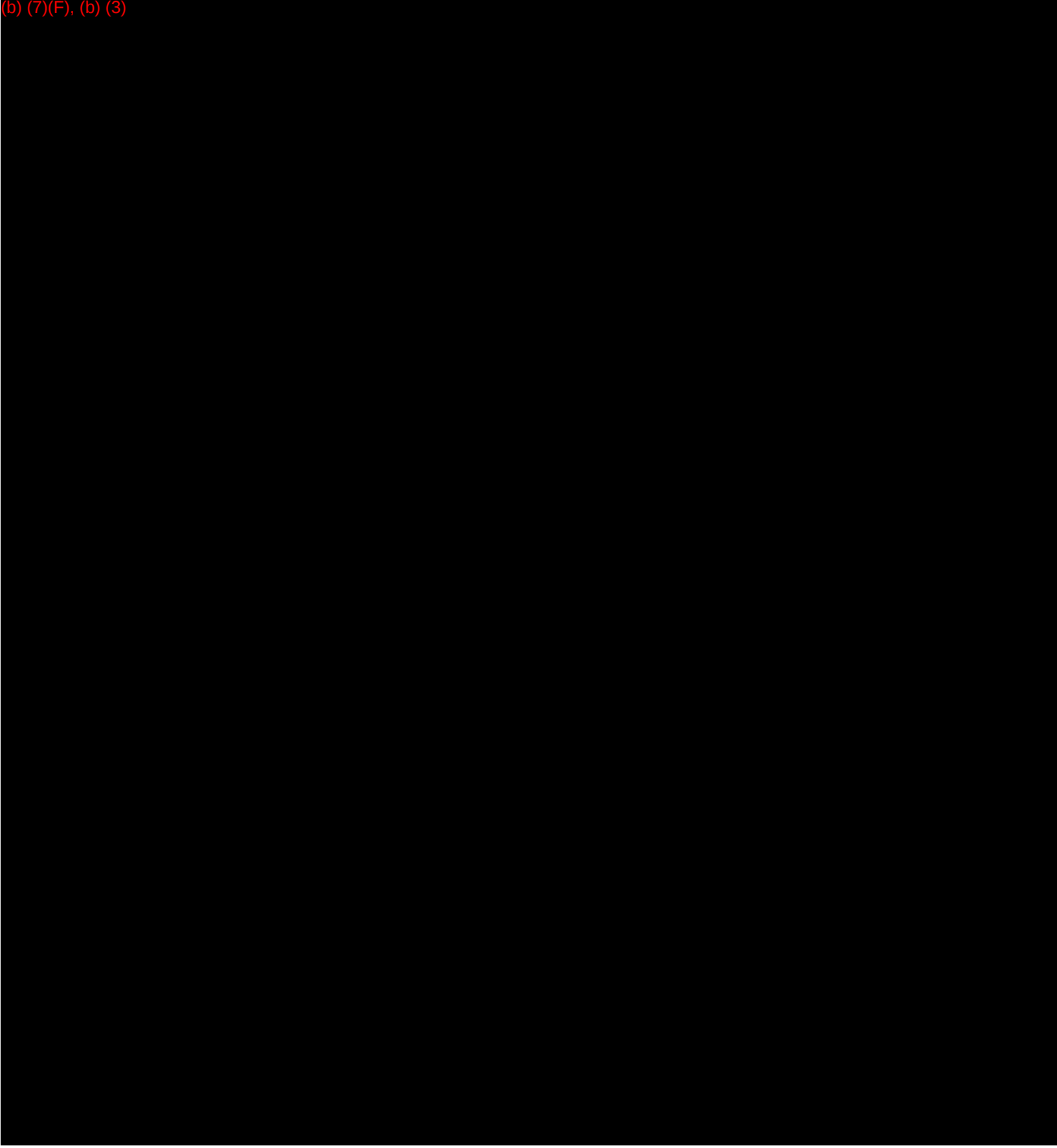


FIGURE GULK.1
GULKANA RIVER SCENARIO MAP

(b) (7)(F), (b) (3)

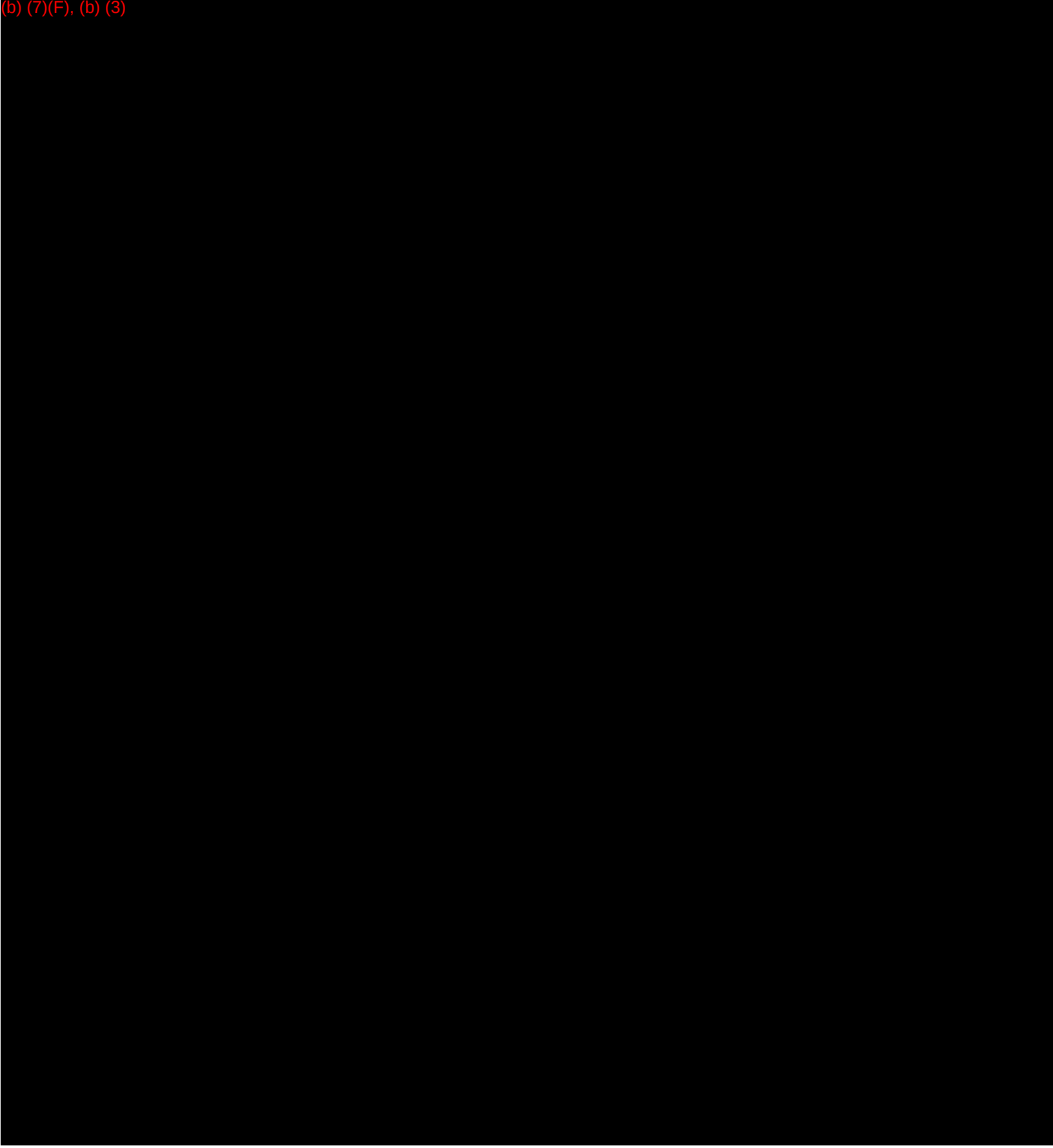


FIGURE GULK.2
GULKANA RIVER SCENARIO DEPLOYMENT MAP

TABLE GULK.1 GULKANA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1330-1430)	Hour 1-3 Day 1 (1430-1630)	Hour 3-6 Day 1 (1630-1930)	Night Shift (Hour 6-16) Day 1 (1930-2400); Day 2(0000-0530)
Situation/Status • **Weather** • **Environmental**	Late summer (August). Winds from the south at 3 mph. Temperature 61ºF.			
Objectives and Strategies[1]	**Objectives**	**Strategies**		
	Site security: safety, site control, and surveillance.	Control site access, review initial safety assessment, develop site safety plan, control waterway and airspace, develop and implement leading edge tracking.		
	Contain oil on land.	Contain on land if possible, use settlement ponds. Prepare to shut in the pipeline, redirect oil flow away from facilities.		
	Restrict oil spread on Gulkana River.	Deploy task forces, mobilize resources to maximize containment and recovery. Contain as near to pipeline as poss ble. Initiate free oil recovery beyond primary containment areas (Gulkana River). Track oil movements.		
	Implement recovery operations.			
	Control the source.	Shut in pipeline.		
	Repair the hole in the pipeline.			
	Agency and stakeholder notification	The following State and Federal Agencies are notified by OCC: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.		
Fire Prevention, Control, and Safety	The safety specialist is mobilized from Glennallen Response Base and arrives on-site at T + 1.5 hours with air monitoring equipment. A site safety analysis using the "Site Safety and Control Analysis" form (Form ICS 201-5) is completed to provide identification of potential hazards, personal protective equipment (PPE) requirements, decontamination procedures, and a river safety plan for the [redacted]. The information is radioed to the Initial Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site. All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If the LEL is >20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of non-sparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire foam skid, wheeled 150 pound extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive fire operations will be conducted from outside the hot zone to control advanced exterior fires using high-volume hand lines. The primary mission of the firefighters is personnel safety and protection. A 5-person fire fighting crew is mobilized from Valdez by road to Glennallen Response Base, where they mobilize the Glennallen Response Base fire foam skid to the spill site. The fire foam skid with fire fighters arrive at T + 4 hours. The fire foam skid is placed on standby at the site. As containment sites are established, fire extinguishers are positioned at each site to provide incipient fire response.			
Discharge Tracking	The Glennallen Response Base helicopter is mobilized for tracking oil. One of the responders from TF-2 intermittently conducts aerial tracking, radios the information to the Ops Section Chief, and then returns to TF-2. The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking will be done by air, on the ground, or both. Aerial tracking will be done visually by helicopter. On the ground, tracking will be done by containment and recovery operations personnel who will establish the extent of spread of the spilled oil. In the initial response, tracking reports will be made to the incident command center via radio at least on an hourly basis.	The frequency of oil trajectory observations will be almost continuous during the initial hours of the response. Incident Commander tracks discharge on a situation status map. Incident Command Staff formulate or adjust incident objectives, define strategies, and prioritize actions.	As the containment and recovery operations are established and the risk of spread is reduced, reports will be provided less frequently.	
Protection of Environmentally Sensitive Areas (ESAs)	[redacted]			
Emergency Actions	OCC shuts in the pipeline and closes remote gate valve (RGVs) in the line segments. RGV 98A and check valve (CKV) 99 isolate the leak.			
Communications	The spill site is within 20 miles of Round Top Mountain Communication Tower. Containment Site 10-16 is within 4 miles of Gu kana Communications Tower. Response command and control communications will be conducted over handheld, vehicle, and boat radios. If additional containment and recovery sites are established down river between the spill site and CS10-16, portable radio repeater sets will be needed due to the steep bluffs shadowing line of sight to the communication towers.			

TABLE GULK.1 (CONTINUED) GULKANA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1330-1430)	Hour 1-3 Day 1 (1430-1630)	Hour 3-6 Day 1 (1630-1930)	Night Shift (Hour 6-16) Day 1 (1930-2400); Day 2(0000-0530)
Response Actions	The Glennallen Response Base RBS assumes the positions of Initial Incident Commander (IIC) and Operations Section Chief. The regional OC mobilizes to the site, and on arrival at T + 3 hours, takes over the IIC position. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Fairbanks Emergency Operations Center is set up... The Safety Officer and Environmental Coordinator mobilize to the site. The Mobile Command Post with the "Go Team" is mobilized to the scene. Based on the threat of sabotage, a complete reconnaissance of the pipeline is ordered. Priority is given to the area around the Gulkana River. The Glennallen Response Base Response Team is mobilized and requested to deploy containment and recovery equipment at containment site CS10-17 and spill site (TF-1 and TF-2) The Delta Response Base responders/ PS09 (6) are mobilized and requested to report to RGV 100 to establish containment and recovery at an Area of Opportunity #1on the Gu kana River (TF-3) The off shift Glennallen Response Base responders (7) are recalled and requested to report to RGV 102 to establish containment and recovery at an Area of Opportunity #2 on the Gu kana River (TF-4) Eight (8) Ship Escort/Response Vessel System (SERVS) personnel (6-TCC and 2-APSC) are mobilized and requested to report CS 10-1 to establish containment and recovery at CS10-16 (TF-5) Baseline contractor (response action contractor) mobilizes a night shift of 25 people who report to the staging area at 1900 hours.			
Response Actions **Task Force 1** **Containment and Recovery at Spill Site**	A 5-person crew (TF-1) from the Glennallen Response Base mobilizes with equipment shown in Table GULK.3 to the spill site.	The Glennallen Response Base Operator brings the D-6 dozer (on a trailer) from Glennallen Response Base and begins trenching and berming activities on the work pad to minimize the volume of oil that gets off the work pad. Due to the unstable nature of the soils, all activity with the dozer is restricted to the work pad.	TF-2 continues berming and trenching operations to restrict the flow of oil. Bermed oil is recovered utilizing a vac truck from GRB.	The baseline contractor night shift takes over berming and trenching operations.
Response Actions **Task Force 2** **Containment and Recovery at CS10-17**	A 5-person crew (TF2) from the Glennallen Response Base is mobilized with equipment shown in Table GULK.4 to containment site CS10-17 to provide initial response.	The 5-person Glennallen Response Base crew (TF-2) arrives on-site at T + 2 hours and deploys 1,500 feet of diversion boom at CS10-17. The oil is driven to shore on the east side of the river, immediately below the bridge on AR26 APL/AMS-2. (2) Elastec TDS 188G skimmer with a derated recovery capacity of 20 bph each are deployed, along with 20,000 gallons of portable storage capacity.	This containment site is operational at T + 4 hours.	The baseline contractor night shift takes over containment and recovery operations. Recovery at this location is complete at T + 12 hours. The vac truck is used to transport the recovered oil to Valdez for injection.
Response Actions **Task Force 3** **Containment and Recovery at Gulkana River Area of Opportunity**	The Delta Response Base/PS09 responders (6) are mobilized and requested to report to RGV 100 to establish containment and recovery at an Area of Opportunity on the Gulkana River (TF-3)		The 6-person Delta Response Base/PS09 crew (TF-3) arrives on-site at T + 4 hours and deploys 1,500 feet of diversion boom at an Area of Opportunity on the Gulkana. Utilizing the Fairbanks Helicopter, equipment is deployed to the area of opportunity. Oil diverted to shore utilizing boom and Boom Vanes. (1) Lamor MiniMax 12 skimmer with a derated recovery capacity of 16 bph is deployed, along with 3,000 gallons of portable storage capacity. This containment site is operational at T + 6 hours.	The baseline contractor night shift takes over containment and recovery operations.
Response Actions **Task Force 4** **Containment and Recovery at Gulkana River Area of Opportunity**	The off shift Glennallen Response Base responders (7) are recalled and requested to report to RGV 102 to establish containment and recovery at an Area of Opportunity on the Gulkana River (TF-4)		The 7-person Glennallen Response Base crew (TF-4) arrives on-site at T + 4 hours and deploys 1,500 feet of diversion boom at an Area of Opportunity on the Gulkana. Utilizing the Glennallen Response Base Helicopter, equipment is deployed to the area of opportunity. Oil diverted to shore utilizing boom and Boom Vanes. (1) Lamor MiniMax 12 skimmer with a derated recovery capacity of 16 bph is deployed, along with 3,000 gallons of portable storage capacity. This containment site is operational at T + 6 hours.	The baseline contractor night shift takes over containment and recovery operations.
Response Actions **Task Force 5** **Containment and Recovery at CS10-16**	Eight (8) Ship Escort/Response Vessel System (SERVS) personnel (6-TCC and 2-APSC) are mobilized by road with containment and recovery equipment (Table GULK.7) to CS10-16. (TF-5)	. .	The Delta Response Base responders (TF-5) arrive at T + 4 hours and are assigned the task of establishing a containment and recovery site at CS10-16. Diversionary boom is deployed to drive oil to the north shore immediately upstream of where Richardson Highway crosses the Gulkana River. Two (2) Aqua Guard RBS 5 skimmer with a derated recovery capacity of 21 bph is deployed along with 20,000 gallons of storage capacity. This containment site is operational at T + 6 hours. Additional storage capacity arrives at T + 5 hours. Two 10,000 gallon bladders are positioned onshore to be filled with recovered oil.	The baseline contractor night shift takes over for TF-5. Oil has not yet reached this containment site, so TF-5 continues to monitor the containment site. Additional portable storage is available at the staging area, if needed.

TABLE GULK.1 (CONTINUED) GULKANA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (1330-1430)	Hour 1-3 Day 1 (1430-1630)	Hour 3-6 Day 1 (1630-1930)	Night Shift (Hour 6-16) Day 1 (1930-2400); Day 2(0000-0530)
Response Actions **Task Force 6** **Repair the Pipeline**	The Fairbanks Initial Response Team is notified of pipeline repair needed at the spill site.	The Fairbanks Initial Response Team is mobilized out of Fairbanks Response Base to install a bullet clamp. Estimated time of arrival of the repair crew equipment (see Table GULK.8) from Fairbanks Response Base is 10 hours. The team members are flown by charter aircraft to Glennallen Response Base approximately 2 hours prior to their equipment arriving. Valdez mobilizes a 40-ton crane and additional equipment from Glennallen Response Base (Table GULK.8) to the site.	Equipment from Valdez and Glennallen Response Base arrives on-site.	The Fairbanks Initial Response Team arrives from Fairbanks Response Base at T + 10 hours and begins preparations for repair. The repair crew cuts off the insulation and installs the bullet clamp. In total, this work takes 4 hours and is completed at T + 14 hours.
Response Actions **Additional Resources for Containment and Recovery**	Fairbanks Response Base responders are mobilized with equipment shown in Table GULK.9 to support containment and recovery.		Fairbanks Response Base responders arrive at T + 5 hours. Responders assist TF-1 and TF-2 as needed. Additional resources mobilized by these crews are put on standby. Baseline contractor night shift arrives at T + 5 hours.	Baseline contractor night shift takes over containment and recovery operations for TF-1, TF-2, TF-3, Tf-4 and TF-5
Wildlife Protection/ Rehabilitation **Task Force 7** **Wildlife Response**	A wildlife response operation is immediately initiated as outlined in Volume 1, Section 1.6.11, "Wildlife Protection." The EC takes the following steps: 1. CCI is requested to provide ten wildlife hazers. CCI wildlife hazers begin mobilizing to the spill site. 2. CCI is contacted to mobilize the wildlife treatment center stationed at Fairbanks Response Base. 3. Alaska Clean Seas (ACS) and SERVS are placed on standby for the poss ble use of their wildlife response facilities or provisions of additional hazing and/or capture and treatment equipment. 4. The International Bird Rescue Research Center (IBRRC) out of Berkeley, California, is notified and requested to mobilize a full scale hazing operation as well as capture and stabilization operation. This includes making the Anchorage wildlife facility operational.			CCI wildlife hazers arrive on-site at T + 10 hours with the wildlife treatment center.
Drinking Water Protection **Task Force 8** **Drinking Water Response**	Environmental Coordinator (FEC) mobilizes to the site.	(b) (7)(F), (b) (3) [redacted]		(b) (7)(F), (b) (3) [redacted]

TABLE GULK.1 (CONTINUED) GULKANA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Hour 16 + Day 2 (0530) +
Task Force 5 **Containment and Recovery at CS10-16**	Oil arrives at CS10-16 at T + 37 hours. TF-5 uses (2) Agua Guard RBS-5 skimmers to recover oil which is transferred to the portable storage brought on-site. Recovery takes approximately 12 hours and is completed by T + 60 hours. Recovered oil is transported by the vac truck to Valdez for injection.
Response Actions **Longer Term**	All work crews are housed in commercial accommodations in Glennallen. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required. Gulkana Village Drinking Well: Water is provided to the Gulkana Village holding tank until sampling of the village well post cleanup confirms that the well meets water quality standards for Total Aromatic Hydrocarbons (TAH) and Total Aqueous Hydrocarbons (TAqH).
Storage and Disposal	Contaminated soils from the work pad are removed and temporarily stored at the Glennallen Response Base. Based on volume, contaminated soils are either hauled to Fairbanks for incineration or a portable incinerator is mobilized to the Glennallen Response Base. Recovered oil is taken to Valdez for injection.
Wildlife Protection / Rehabilitation **Task Force 7** **Wildlife Response**	The IBRRC is on location within 24 hours and takes over coordination of the overall wildlife response operation.
Shoreline Cleanup Plan	Work crews clean the tundra in the area of PLMP 654. During the days that follow, cleanup activities focus on the oil remaining along the shorelines of the Gulkana River and other affected drainages. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the Shoreline Cleanup Assessment Team (SCAT) process. Oiled gravel on the work pad is stored in a temporary lined area for later cleaning or incineration and reuse. The shoreline types in the potentially impacted areas are assessed and are found to include sand and gravel mixed with peat, vegetated shores, mud, and wetlands. Passive collection/manual removal and cold-water low-pressure wash with cold water deluge with recovery are selected as shoreline cleanup techniques. Rope mops, pumps, and vacuum systems with booms and skimmers are used to recover deeper pools of oil when poss ble. Oiled peat slurries may be removed by small loaders and transported to stable areas for cleaning. Peat outcrops will be raked manually, followed by tilling of the lightly contaminated peat to speed physical and biological cleaning. Impacts causing further damage to the shorelines are minimized. Natural recovery and nutrient enrichment (bioremediation) are recommended as long-term cleanup techniques. Mobilization of equipment and personnel for shoreline cleanup is coordinated with the progress of recovery operations. Over a period of about two weeks, the shoreline cleanup crews recover about one-half of the oil volume estimated to remain onshore following completion of the initial recovery efforts. The initial shoreline cleanup is determined to be complete, and long-term cleanup techniques are implemented along with a long-term monitoring program. Cleanup is completed and approved by regulatory agencies. A final spill report is completed and submitted to the agencies as required.
Drinking Water Protection **Task Force 8** **Drinking Water Response**	T + 36 hours: Water provider delivers second load. T + 36 hours: Environmental Contractors continue daily water monitoring.

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, depending on such factors as personnel safety and environmental conditions. Other combinations of resources and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE GULK.2 GULKANA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1330-1430								Hour 1-3 1430-1630							Hour 3-6 1630-1930						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbls/hr)	Storage[3] No.	Storage[3] Capacity (bbl)	People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbls/hr)	Storage[3] No.	Storage[3] Capacity (bbl)	People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3] No.	Skimmers[3] Capacity (bbl/hr)	Storage[3] No.	Storage[3] Capacity (bbl)
Security	Site Control	Security			--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT/TF1	--	--	--	1 helicopter (1)[4]	--	--	--	--	--	--	1 helicopter (1)[4]	--	--	--	--	--	--	Helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT/TF1	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--	Note[5]	--	--	--	--	--	--
Fire Protection	Fire Protection	Fire Crew	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	GRB fire foam skid (1)	--	--	--	--
Safety	Site Safety and Control[6]	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Response Actions	Contain Oil on Land	TF-1 Containment and Recovery at Spill Site	--	--	--	--	--	--	--	--	5	D-3 dozer (1)[8] GRB Vac Truck (1)[8] 966 Loader (1)		1	[redacted]	varies	[redacted]	5	D-3 dozer (1)[8] GRB Vac Truck (1)[8] 966 Loader (1)		1	[redacted]	varies	[redacted]
	Contain and Recover Oil	TF-2 Containment and Recovery at CS10-17	--	--	--	--	--	--	--	--	5		GRB response trailer 1500 ft of boom 2 riverboats (2) (2) Elastec TDS 118G Groove Skimmers	2		3		5	PS10 Vac Truck(1)	GRB response trailer 1500 ft of boom 2 riverboats (2) Elastec TDS 118G Groove Skimmers	2		3	
	Contain and Recover Oil	TF-3 Containment and Recovery at AOO									6									Helicopter (1)[4] 1500' boom Boom vane Lamor MiniMax 12 skimmer (3) 1,000 gallon tanks	1		3	

TABLE GULK.2 (CONTINUED) GULKANA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1330-1430								Hour 1-3 1430-1630							Hour 3-6 1630-1930						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity (bbl)				No.	Capacity (bbls/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Response Actions (continued)	Contain and Recover Oil	TF-4 Containment and Recovery at AOO									7									Helicopter (1)[4] 1500' boom Boom vane Lamor MiniMax 12 skimmer (3) 1,000 gallon tanks	1	(b) (7)(F), (b) (3)	3	(b) (7)(F), (b) (3)
	Contain and Recover Oil	TF-5 Containment and Recovery at CS10-16	--	--	--	--	--	--	--	--		--						8	Valdez terminal Vac Truck (1)	SERVS Oil spill response trailer (2) Aqua Guard RBS-5 skimmers 2300 ft of boom 2 ea. 238-bbl bladders	2		2	
	Additional Resource Requirements for Containment and Recovery	--	--	--	--	--	--	--	--	--	--	--						25 (night shift)	FRB Vac Truck	FRB 45' Spill Trailer FRB 26' Summer Spill Trailer Aqua Guard RBS-5 skimmer Komara 12 K Skimmer	2		--	--
Source Control	Repair the Pipeline	TF-6 Repair Pipeline	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Crane (40 ton) 930-fork lift 185 air compressor	--	--	--	--	--
Wildlife Response	Wildlife Protection/ Rehabilitation	TF-7 Wildlife Response	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
(b) (7)(F), (b) (3)			--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--
On-Scene Comms.	Communication Support	Comms.	--	--	--	Handheld, vehicle, and boat radios	--	--	--	--	--	--	Handheld, vehicle, and boat radios	--	--	--	--	--	--	Handheld, vehicle, and boat radios	--	--	--	--

TABLE GULK.2 (CONTINUED) GULKANA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 1330-1430								Hour 1-3 1430-1630							Hour 3-6 1630-1930						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbls/hr)	No.	Capacity (bbl)				No.	Capacity (bbls/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Personnel Total			Note 7	--	--	1					25	3	1					58	5	14				
Mechanical Equipment Total					--	1						3	5						9	15				

TABLE GULK.2 (CONTINUED) GULKANA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Night Shift (Hour 6-16) 1930-0530							Hour 16+ 0530+						
			People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
						No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	1	--	--	--	--	--	--	1	--	--	--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	1 helicopter (1)[4]	--	--	--	(b) (7)(F), (b) (3)	--	--	1 helicopter (1)[4]	--	--	--	--
	Ground Tracking[5]	DT	Note 5	--	--	--	--	--		Note 5	--	--	--	--	--	--
Fire Protection	Fire Protection	FP	--	--	1 Glennallen Response Base fire foam skid (2)	--	--	--		--	--	1 Glennallen Response Base fire foam skid (2)	--	(b) (7)(F), (b) (3)	--	--
Safety	Site Safety and Control[6]	--	1	--	--	--	(b) (7)(F), (b) (3)	--		1	--	--	--		--	--
Response Actions	Contain Oil on Land	TF-1 Containment and Recovery at Spill Site	5	D-3 dozer (1)[8] GRB Vac Truck (1)[8] 966 Loader (1)		1		varies		5	D-3 dozer (1)[8] GRB Vac Truck (1)[8] 966 Loader (1)		1		varies	(b) (7)(F), (b) (3)
	Contain and Recover Oil	TF-2 Containment and Recovery at CS10-17	5		GRB response trailer 1,500 ft of boom 2 riverboats (2) (2) Elastec TDS 118G Groove Skimmers	2		3		5		GRB response trailer 1,500 ft of boom 2 riverboats (2) (2) Elastec TDS 118G Groove Skimmers	2		3	
	Contain and Recover Oil	TF-3 Containment and Recovery at AOO	6		Helicopter (1)[4] 1,500' boom Boom vane Lamor MiniMax 12 skimmer (3) 1,000 gallon tanks	1		3		6		Helicopter (1)[4] 1,500' boom Boom vane Lamor MiniMax 12 skimmer (3) 1,000 gallon tanks	1		3	
	Contain and Recover Oil	TF-4 Containment and Recovery at AOO	7		Helicopter (1)[4] 1,500' boom Boom vane Lamor MiniMax 12 skimmer (3) 1,000 gallon tanks	1		3		7		Helicopter (1)[4] 1,500' boom Boom vane Lamor MiniMax 12 skimmer (3) 1,000 gallon tanks	1		3	

TABLE GULK.2 (CONTINUED) GULKANA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Night Shift (Hour 6-16) 1930-0530							Hour 16+ 0530+						
			People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
						No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Response Actions (continued)	Contain and Recover Oil	TF-5 Containment and Recovery at CS10-16	8	Valdez terminal Vac Truck (1)	SERVS Oil spill response trailer (2) Aqua Guard RBS-5 skimmers 2300 ft of boom 2 ea. 238-bbl bladders	2	(b) (7)(F), (b) (3)	2	476 total	8	Valdez terminal Vac Truck (1)	SERVS Oil spill response trailer (2) Aqua Guard RBS-5 skimmers 2300 ft of boom 2 ea. 238-bbl bladders	2	(b) (7)(F), (b) (3)	2	(b) (7)(F), (b) (3)
	Additional Resource Requirements for Containment and Recovery	--	FRB Vac Truck	FRB 45' Spill Trailer FRB 26' Summer Spill Trailer Aqua Guard RBS-5 skimmer Komara 12 K Skimmer	2	53	--	--		FRB Vac Truck	FRB 45' Spill Trailer FRB 26' Summer Spill Trailer Aqua Guard RBS-5 skimmer Komara 12 K Skimmer	2	53	--	--	
Source Control	Repair the Pipeline	TF-6 Repair Pipeline	12 + 1 P&CM	Crane (40 ton) (1) 8 930-fork lift (1)[8] 185 air compressor	100-ft x 100-ft reinforced liner 200-ft of 12-in x 12-in timbers 48-in x 22½-in Bullet clamp 1½-in impact gun rigging package 1-in female to 1½-in male adaptor 1-in drive torque wrench 1-in drive multiplier 1½-in drive multiplier 37/8-in knocker wrench 1 box of half round bastard files 37/8-in shaved socket 1½-in drive	--	--	--	--	12 +1 P&CM	Crane (40 ton) (1)[8] 930-fork lift (1)[8] 185 air compressor	100-ft x 100-ft reinforced liner 200-ft of 12-in x 12-in timbers 48-in x 22½-in Bullet clamp 1½-in impact gun rigging package 1-in female to 1½-in male adaptor 1-in drive torque wrench 1-in drive multiplier 1½-in drive multiplier 37/8-in knocker wrench 1 box of half round bastard files 37/8-in shaved socket 1½-in drive	--	--	--	--
Wildlife Response	Wildlife Protection/ Rehabilitation	TF-7 Wildlife Response	10 CCI	--	Wildlife treatment center	--	--	--	--	10 CCI 10 IBRRC	--	Wildlife treatment center	--	--	--	--
(b) (7)(F), (b) (3)																
On-Scene Comms.	Communications Support	Comms.	Mobile Command Post (12)		Handheld, vehicle, and boat radios	--	--	--	--	--	--	Handheld, vehicle, and boat radios	--	--	--	--

TABLE GULK.2 (CONTINUED) GULKANA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Night Shift (Hour 6-16) 1930-0530							Hour 16+ 0530+						
			People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
						No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Personnel Total			96	6	7					106	6	7				
Mechanical Equipment Total				11	15						11	15				

[1] Number of people excludes State or Federal representatives in the organization.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] Under contract.

[–] Not arrived on site. May be mobilized or en route.

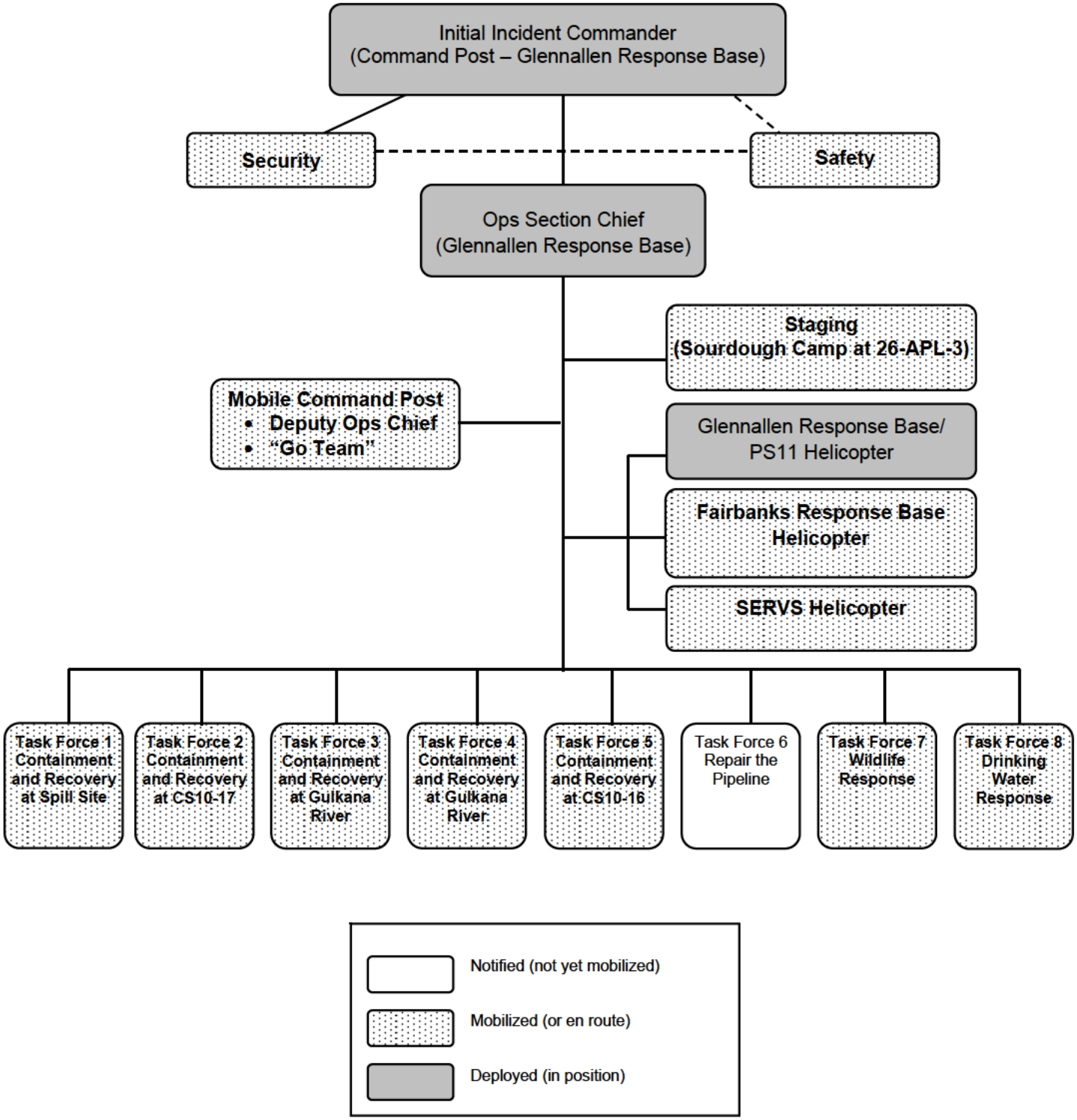


FIGURE GULK.3
GULKANA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

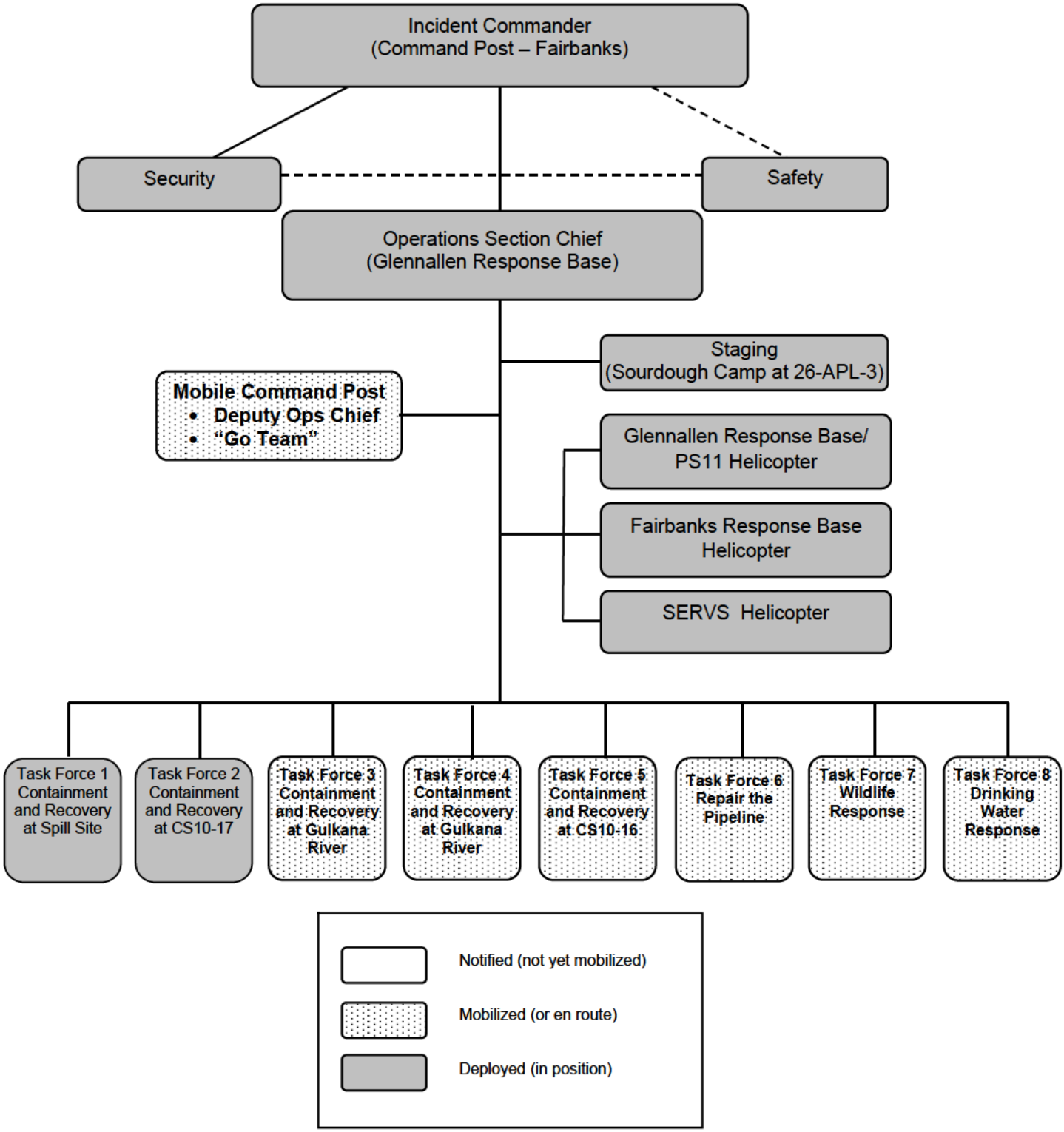


FIGURE GULK.4
GULKANA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

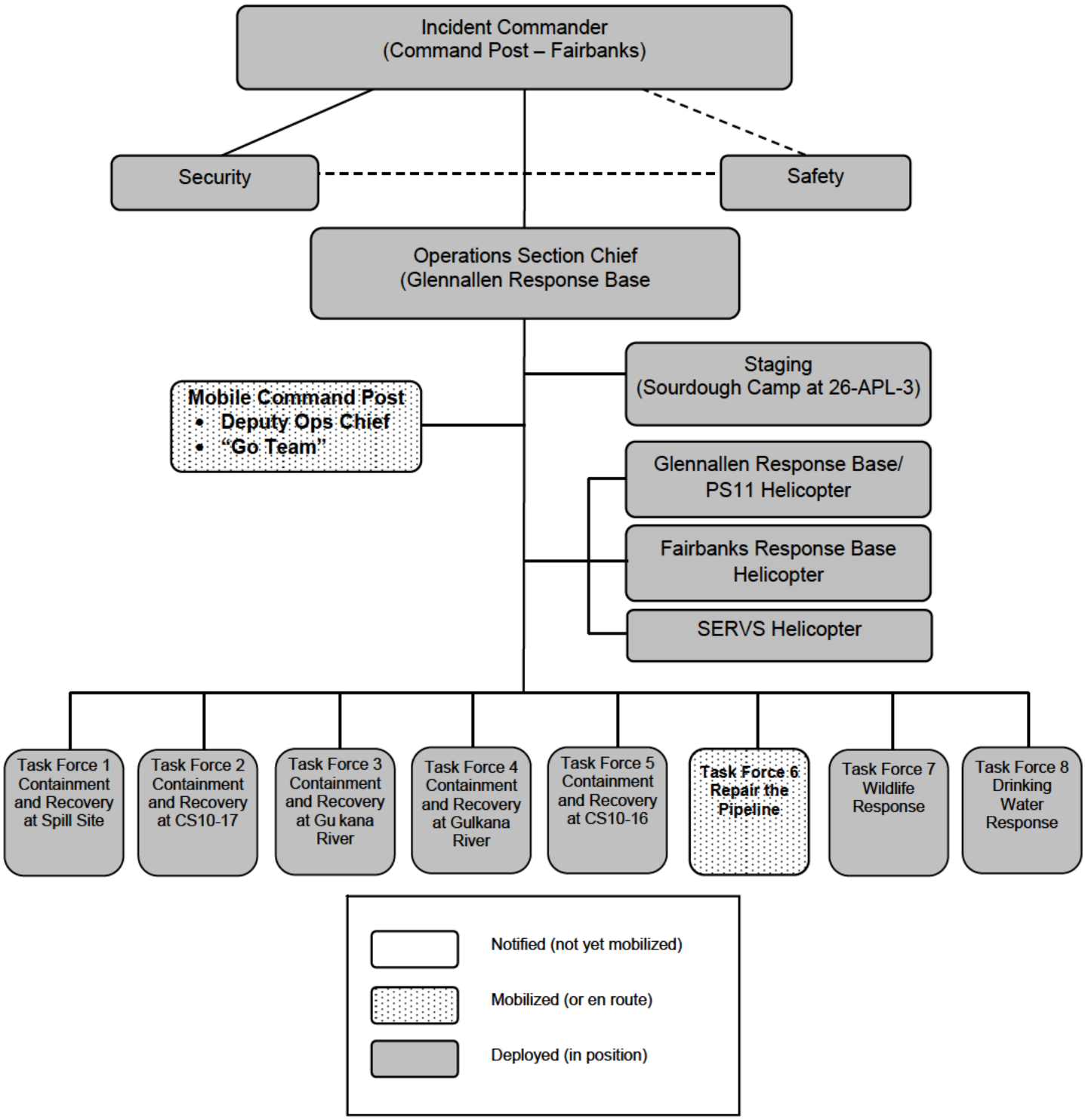


FIGURE GULK.5
GULKANA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-6

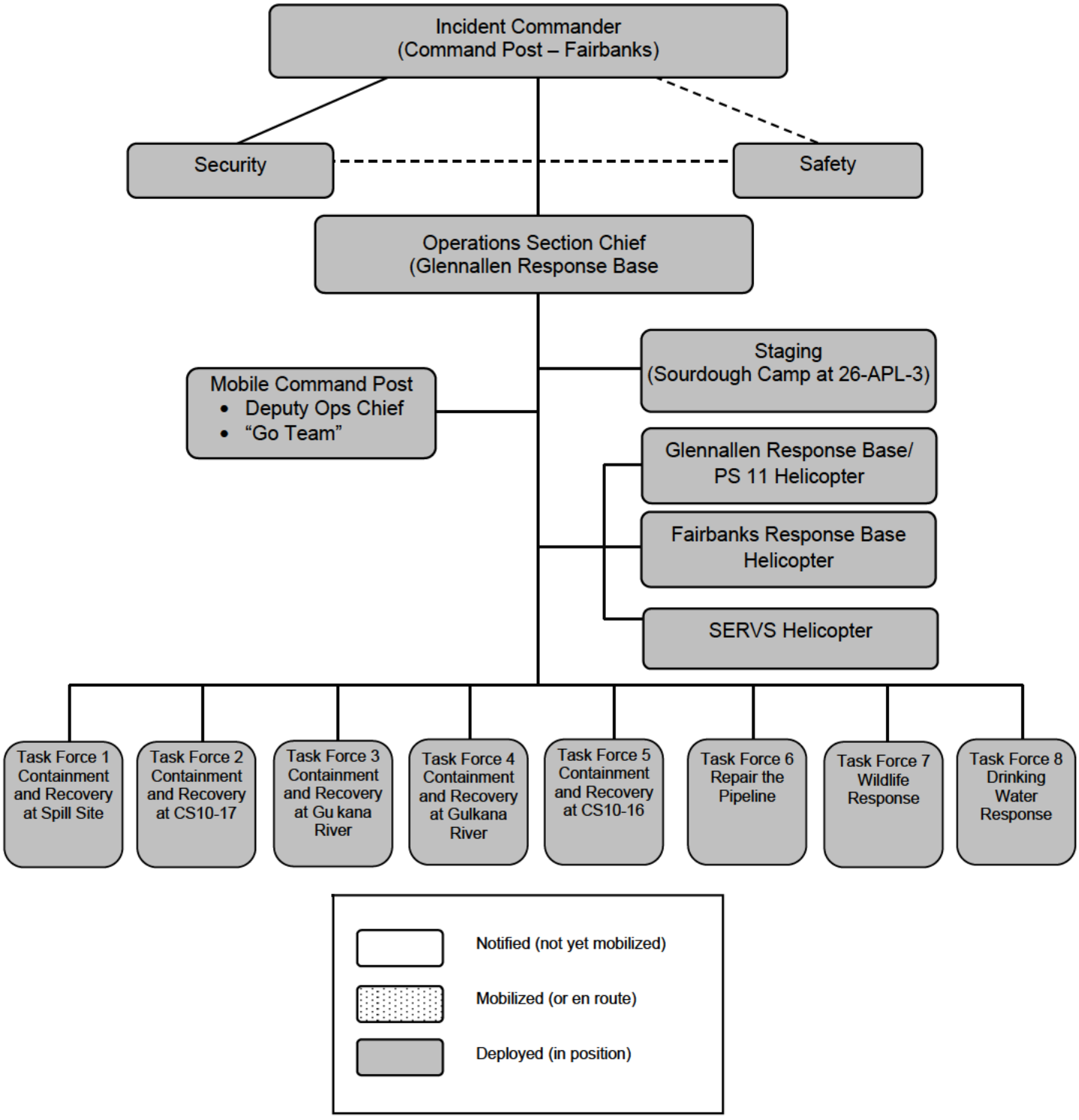


FIGURE GULK.6
GULKANA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 6+

TABLE GULK.3 GULKANA RIVER SCENARIO
RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT SPILL SITE

Equipment/Personnel (Quantity)	Location	Purpose	ETA On Site
Vac truck (1)	Glennallen Response Base	Oil storage and transport	T + 2 hr
D-6 dozer (operator included in crew of 5 – TF-1)	Glennallen Response Base	Spill containment	T + 2 hr
966 Loader (operator included in crew of 5 – TF-1)	Glennallen Response Base	Spill containment	T + 2 hr
Glennallen Response Base Response Team – TF-1 (5)	Glennallen Response Base	Task Force 2	T + 2 hr
Fire foam skid	Glennallen Response Base	Fire suppression	T + 4 hr
Fire Fighting Crew (5)	Valdez	Fire suppression	T + 4 hr

TABLE GULK.4 GULKANA RIVER SCENARIO
RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT CS 10-17

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Glennallen Response Base Response Team – TF-2 (5)	Glennallen Response Base	Labor	T + 2 hr
Oil spill response trailer	Glennallen Response Base	Response equipment	T + 2 hr
Boom (1,500 feet)	Glennallen Response Base	Diversionary and containment booming	T + 2 hr
2 each riverboats	Glennallen Response Base	Work platforms	T + 2 hr
Helicopter	Glennallen Response Base	Spill tracking/mapping	T + 1 hr
2 each Elastec TDS 118G Grooved Skimmer	Glennallen Response Base	Recovery	T + 2 hr
20,000 gallons of storage	Glennallen Response Base	Storage	T + 2 hr
Vac Truck	PS10	Recovery	T + 3 hr

TABLE GULK.5 GULKANA RIVER SCENARIO
RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT GULKANA A00 #1

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Delta Response Base/PS09 Response Team – TF-3 (6)	PS09	Labor	T + 4 hr
Oil spill response trailer	PS09	Response equipment	T + 4 hr
Boom vane	RGV 100	Containment booming	Pre-staged
Boom (1,500 feet)	RGV 100	Containment booming	Pre-staged
Helicopter	Fairbanks Response base	Sling loading equipment	T + 2 hr
Lamor MiniMax 12 skimmer	RGV 100	Recovery	Pre-staged
3000gallons of storage	RGV 100	Storage	Pre-staged

TABLE GULK.6 GULKANA RIVER SCENARIO
RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT GULKANA A00 #2

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Glennallen Response Team – TF-4 (7)	GRB	Labor	T + 4 hr
Oil spill response trailer	GRB	Response equipment	T + 4 hr
Boom vane	RGV 102	Containment booming	Pre-staged
Boom (1,500 feet)	RGV 102	Containment booming	Pre-staged
Helicopter	SERVS	Sling loading equipment	T + 2 hr
Lamor MiniMax 12 skimmer	RGV 102	Recovery	Pre-staged
3000 gallons of storage	RGV 102	Storage	Pre-staged

TABLE GULK.7 GULKANA RIVER SCENARIO
RESOURCE REQUIREMENTS FOR CONTAINMENT AND RECOVERY AT CS10-16

Equipment/Personnel (Quantity)	Location	Purpose	ETA
SERVS – TF-5 (8)	SERVS	Labor	T + 4 hr
Oil spill response trailer	SERVS	Initial response	T + 4 hr
Aqua Guard Skimmer (2)	SERVS	Recovery operations	T + 4 hr
56,000 gallons portable storage	SERVS	Temporary storage	T + 4 hr
Boom (500 ft)	SERVS	Diversion booming	T + 4 hr
Boom (1,800 ft)	SERVS	Diversion and containment booming	T + 4 hr
Vac Truck	Valdez	Recovery	T + 4 hr
10,000 gallon bladders (2)	GRB	Temporary storage	T + 5 hr

TABLE GULK.8 GULKANA RIVER SCENARIO RESOURCE REQUIREMENTS TO REPAIR PIPELINE

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Fairbanks Initial Response Team (12)	Fairbanks Response Base	Labor	T + 10 hr
P&CM	Fairbanks Response Base	Labor	T + 10 hr
48-inch x 22½-inch Bullet clamp	Fairbanks Response Base	Stopping leak and allowing pipeline to return to operation	T + 10 hr
Crane (40 ton)	Valdez	Installation of the clamp	T + 5 hr
930 fork lift	Glennallen Response Base	Moving materials	T + 5 hr
185 CFM Air compressor	Glennallen Response Base	Operation of air driven wrenches	T + 5 hr
1½-inch impact gun (1)	Fairbanks Response Base	Tightening bolts	T + 10 hr
Rigging package (1)	Fairbanks Response Base	Slinging the clamp	T + 10 hr
1 each 1-inch female to ½-inch male adaptor	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
1-inch drive torque wrench (1)	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
1 drive multiplier (1)	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
1½-inch drive multiplier (1)	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
$3^{7}/_{8}$-inch knocker wrench (1)	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
Box of half round bastard files (1)	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
$3^{7}/_{8}$-inch shaved socket 1½-inch drive (1)	Fairbanks Response Base	Special tools for clamp installation	T + 10 hr
Welder (1) Fitters (3) Operator (1) Laborer (2)	Fairbanks Response Base	Site fabrication, preparation and installation	T + 10 hr

TABLE GULK.9 GULKANA RIVER SCENARIO
ADDITIONAL RESOURCE REQUIREMENTS FOR CONTAINMENT AND RECOVERY

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Responders (4)	Fairbanks Response Base	Labor	T + 5 hr
26' Summer Spill Trailer	Fairbanks Response Base	Response equipment	T + 3 hr
45' Spill Trailer	Fairbanks Response Base	Response equipment	T + 5 hr
Baseline contractor crew (25)	Fairbanks Response Base /Valdez	Labor - night shift	T + 5 hr
Aqua Guard Skimmer	Glennallen Response Base	Recovery	T + 2 hr
Komara 12 K	Glennallen Response Base	Recovery	T + 2 hr

TABLE GULK.10 GULKANA RIVER SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table GULK.8. Due to the close proximity of the Gulkana River to the release point, it is assumed that most of the oil will flow into the river. An estimated 20% will be retained on the right-of-way and surrounding tundra. Since the release has gone undetected for nine hours, much of the oil will have already flowed downstream of CS10-17 by the time the responders arrive at CS10-17. It is estimated that 200 bbls will be retained upstream of CS10-17 and 900 bbls will have passed CS10-17 and will be retained at the two Gulkana area of opportunity deployment and CS10-16. The estimated oil trapped on the shoreline and deadfall logs is 200 bbls. Emulsification rates are expected to be less than 20% in the oil retained at CS10-17, and less than 30% in the oil retained at CS10-16. Once deployed, the skimmers are assumed to be operational 80% of the time with derated capacities of 20% of the manufacturer's nameplate rating.

With an estimated river velocity of 2 fps and a distance of 50 river miles, it will take approximately 37 hours for the leading edge of the oil to reach CS10-16. Recovery operations will commence at CS10-16 at T + 37 hr and will be completed by T + 60 hr. No recovery is shown for oil trapped in soil, tundra, or shorelines as these tasks are expected to start after T + 72 hr.

Location	Oil Contained (bbls)	Emulsification (%) / Total (bbls)	Cumulative Oil Recovered (bbls)								
			4 hr	12 hr	24 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)											

Scenario 13. Little Tonsina River

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for a catastrophic release from an aboveground pipeline segment in the former Pump Station 12 area.

The scenario is described by seven components:

1. Introductory text
2. A scenario map and a deployment map depicting the site location (Figures LTONS.1 and LTONS.2)
3. Timeline matrix (Table LTONS.1)
4. On-site resource tally sheet (Table LTONS.2)
5. Response organization charts (Figures LTONS.3 through LTONS.7)
6. Resource mobilization tables (Tables LTONS.3 through LTONS.7)
7. Summary of oil fate and estimated recovery (Table LTONS.8)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a scenario map depicting the spill site and a deployment map that shows containment site, task force, and staging area locations (Figures LTONS.1 and LTONS.2, respectively). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed-upon timeframe for the scenario (Table LTONS.1). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table LTONS.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures LTONS.3 through LTONS.7). The sixth component is a series of resource mobilization tables that summarize the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Tables LTONS.3 through LTONS.7). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table LTONS.8).

The reader is cautioned that the organizational structure and response resources depicted in the scenario describe one way to respond to the incident. A number of alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario primarily describes the functions of the various field teams within the Operations section of the response rather than the actions of the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be expected to actually occur in this system. Valves within the pipeline can be closed automatically or manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 13 – LITTLE TONSINA RIVER
(b) (7)(F), (b) (3)

Response Type	Amount
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3)

Source

The leak occurs in a section of aboveground pipe at Pipeline Milepos (b) (7)(F), (b) to a catastrophic rupture of the pipeline.

Environmental Conditions

Time	0600	**Wind**	10 mph, from North
Season	Summer - August	**Seas**	N/A
Snow/Ice Coverage	N/A	**Temperature**	63 ºF
Visibility	No precipitation	**Tide/Current**	1.7 mph river velocity

Environmental Considerations – Little Tonsina River, Segments 1 - 5

(b) (7)(F), (b) (3)

Assumptions

1. Because of the sudden release, oil escapes from the pipeline at a high rate initially and then drops off as pressure falls and valves close off the remaining oil in the line. A total of (b) (7)(F), of oil is spilled in the first 12 hours.
2. No fire or medical incidents occur as a result of the incident that caused the initial rupture.
3. Alaska Clean Seas (ACS) and Mutual Aid responders are mobilized.
4. Additional response teams from Valdez, Mutual Aid, and contractors (ACS, and CCI). Response Action Contractors (RAC) are mobilized over the response period.
5. Oil is flowing into the Little Tonsina River.
6. Five containment sites are constructed between the pipeline break and the confluence of the Little Tonsina and Tonsina Rivers.

SCENARIO 13 – LITTLE TONSINA RIVER
(b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference	Tactics	Equipment
Volume 3, Sections 4.1.1 and 4.3.3	Containment at containment site (CS) 11-7 (Richardson Highway culvert) will be by culvert blocking, cantenary boom and use of a traffic control kit for road closure. Recovery of spilled oil will be by use of skimmers and portable oil storage tanks.	Volume 2, Table LTON.1, and LTON.3
Volume 3, Sections 4.1.1 and 4.3.3	Containment at the spill site will be establishment of a hot zone, deployment of Shore Guardian boom and trenching. Recovery at spill site will be by using a Shore vac and skimmers.	Volume 2, Table LTON.1, and LTON.3
Volume 3, Sections 4.1.1 and 4.3.3	Containment and recovery at CS11-6 by using containment diversionary/containment booming and recovery will be done by using multiple skimmers, pumps and portable oil tanks.	Volume 2, Table LTON.1, and LTON.3
Volume 3, Sections 4.1.1 and 4.3.3	Containment a(b) (7) will be by diversion/deflection boom. Recovery of spill oil will be by multiple skimmers and portable oil storage tanks.	Volume 2, Table LTON.1, and LTON.3

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Timeline Matrix.)

Actions

Actions are based on the above notifications; number of response activities will begin to occur simultaneously.

1. Operations Control Center (OCC) shuts in the pipeline. Remote gate valve (RGV) 113 and RGV 115 begin closing to isolate the leak.
2. The regional OC assumes the position of Initial Response Incident Commander and the Glennallen Response Base, RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Valdez IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Valdez. The traffic pullout at CS11-6 is identified as the primary staging area.
3. A 5-person crew from the Glennallen Response Base Response Team – (Task Force 1) is mobilized to the Richardson Highway crossing of the Little Tonsina River (near CS11-7) via the helicopter to provide initial response and close the north and south sides of the Richardson Highway.
4. Another 5-person crew from the Glennallen Response Base Response Team – (Task Force 2) is mobilized and requested to deploy containment and recovery equipment at the work pad located at PLMP 733.

   The Safety Officer and Environmental Coordinator (EC) are mobilized.

   Five responders from the Delta Response Base (on- and off-shift) are mobilized and requested to report to Glennallen Response Base.
5. Eight Ship Escort/Response Vessel System (SERVS) personnel (6 – Tatitlek Chenega Chugach, LLC [TCC] and 2 - Alyeska Pipeline Service Company [APSC]) are mobilized and requested to report to the staging area located south of the former PS12 pad site with a land response trailer.
6. The Glennallen Response Base/PS11 helicopter returns from dropping off TF-1 and takes a responder to conduct an aerial reconnaissance of the spill vicinity.

SCENARIO 13 – LITTLE TONSINA RIVER
(b) (7)(F), (b) (3) [redacted]

7. The Fairbanks Initial Response Team (13 responders from the baseline contractor are mobilized out of Fairbanks Response Base. Estimated time of arrival (ETA) of the crew is 7 hours.
8. ACS and Mutual Aid responders are requested to mobilize personnel and recovery equipment to Fairbanks Response Base, transfer to smaller aircraft, and continue to Gulkana Airport to be taken to the spill site by vehicle or helicopter.
9. Additional resources (as shown in Tables LTONS.3 through LTONS.7) from Valdez, ACS and CCI are mobilized over the response period.

Oil Trajectory

Oil is spraying onto the pad and surrounding tundra, east and west of the pipe. The oil is flowing down a gully and into the Little Tonsina River. Due to the volume of oil, it crosses the river and flows out onto the flood plain, surrounding the riverbed, as well as traveling downstream. The river is moving at 1.7 feet per second.

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and the resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an ongoing evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"*, or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill cleanup activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of cleanup required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

(b) (7)(F), (b) (3)

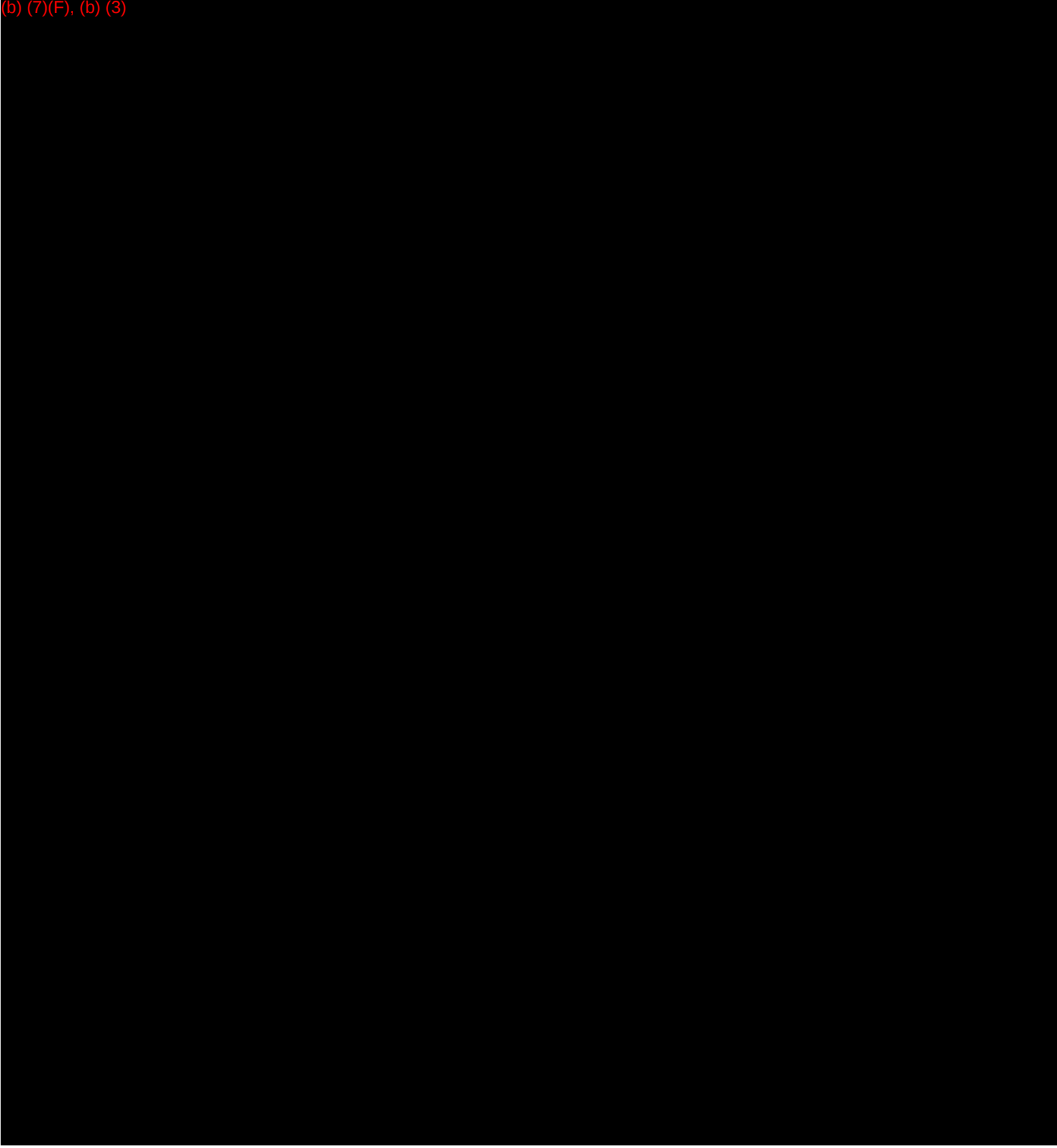


FIGURE LTONS.1
LITTLE TONSINA RIVER SCENARIO MAP

(b) (7)(F), (b) (3)

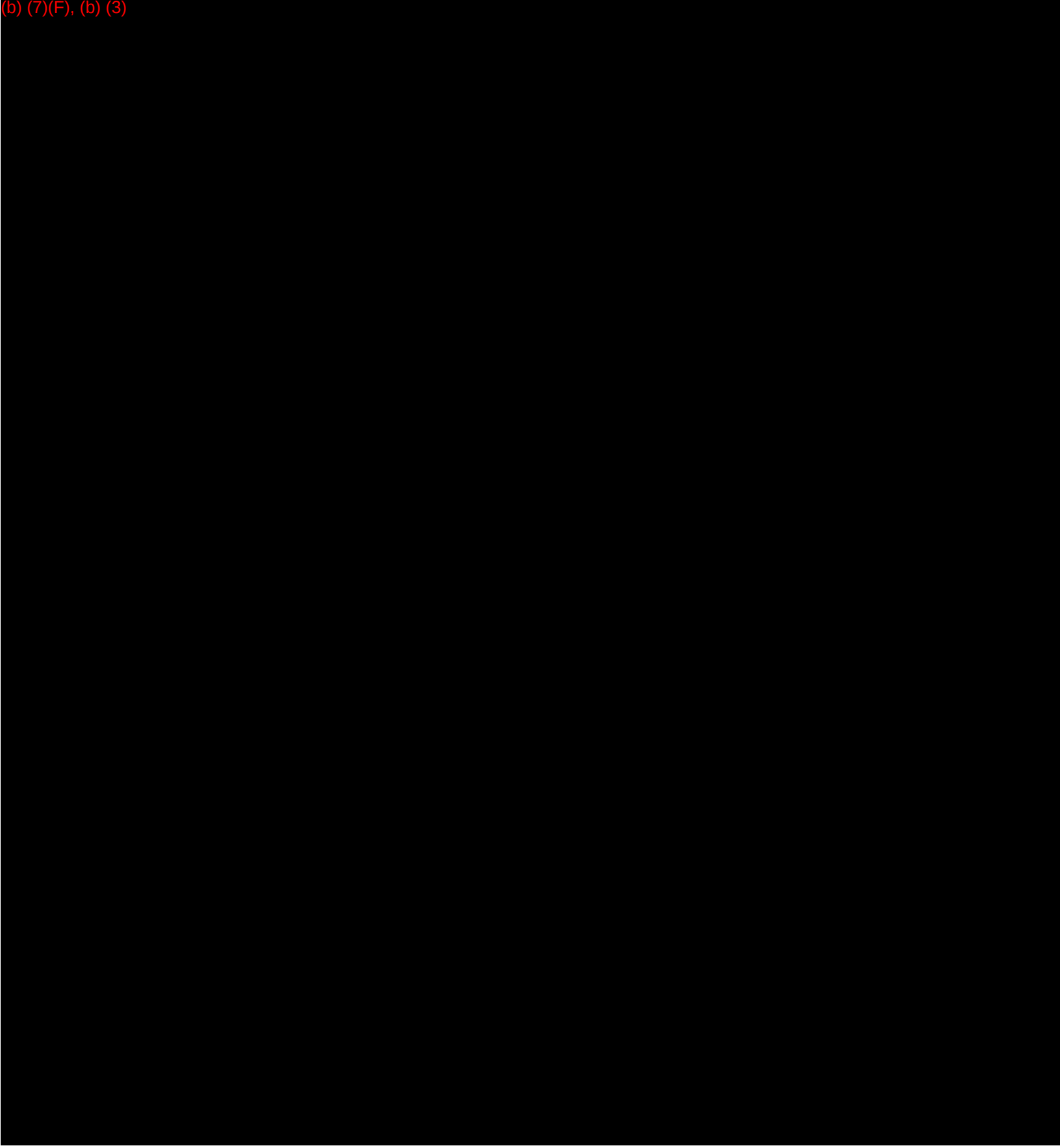


FIGURE LTONS.2
LITTLE TONSINA RIVER SCENARIO DEPLOYMENT MAP

TABLE LTONS.1 LITTLE TONSINA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0600-0700)	Hour 1-3 Day 1 (0700-0900)	Hour 3-5 Day 1 (0900-1100)	Hour 5-12 Day 1 (1100-1800)	Night Shift (Hour 12-24) Day 1 (1800-2400); Day 2(0000-0600)
Situation/Status • **Weather** • **Environmental**	Late summer (August). Temperature 63°F. Wind from the north at 10 mph. River speed is 1.7 feet per second (fps).				
Objectives and Strategies[1]	**Objectives**	**Strategies**			
	Establish site safety, entry, and response procedures for responders.	Identify isolation zones and entry/exit routes at both ends of the spill, develop air and personnel monitoring plans, and communicate to responders. Implement Site Safety Plan and evaluate need for continuous air and personnel monitoring plans due to amount of oil and temperatures.			
	Isolate spill zone and close the Richardson Highway and adjoining airspace.	Request additional security help from Alaska State Troopers and Alyeska security. Move highway closure points far enough back from spill activities so impact response operations are not impacted. Communicate highway status to communities located along Richardson Highway. Request airspace closure from Federal Aviation Administration (FAA) and ensure Notice to Airmen (NOTAM) is issued.			
	Prevent oil from entering the Tonsina River and minimize impacts to the environment due to response activities.	Establish containment and recovery operations at the leak site, CS11-6, and the Richardson Highway culvert near CS11-7 as well as sites of opportunity (b) (7)(F), and areas downstream of CS11-6.			
	Identify and protect Environmental Sensitive Areas (ESAs) and cultural resources within the spill operations area.	Through Alyeska Environmental Department communicate environmental sensitivities to Incident Command (IC) and response staff. Establish if there are any cultural or historical sites that will be impacted by the oil or response activities and take preventative measures to minimize or eliminate impacts.			
	Develop and implement recovery and waste handling plans for recovered oil.	Establish staging areas at both ends of spill and develop recovered oil disposal plans sufficient to prevent storage issues at waste handling sites. Identify portable storage and vacuum units in sufficient quantity to prevent recovery sites from being impacted by inability to offload recovered oil.			
Fire Prevention, Control, and Safety		Safety: The Safety Officer arrives from Glennallen Response Base at 0700 with air monitoring equipment and conducts a site safety analysis using the "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, personal protective equipment (PPE) requirements, and establishment of decontamination. The information is radioed to the Initial Incident Commander and used to verify that all responders have appropriate PPE before entering the spill site. In addition, safety objectives for other areas of the response, such as air operations and ground transportation, are also addressed. Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is >20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck, foam skid, wheeled 150- b extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires utilizing high volume handlines. The primary mission of firefighters is personnel safety and protection. Two Valdez firefighters will be mobilized by the Valdez helicopter to pick up the Glennallen Response Base fire foam skid and mobilize to the site. Two additional Valdez firefighters will mobilize a VMT fire truck to provide fire suppression equipment as standby as well as ambulance service at staging areas. Alyeska Security oversees traffic control at roadblocks.	Continuous air monitoring protocols for zones and personnel established. Baseline short term exposure limit (STEL) and off gassing calculations begin to be established. Initial Site Safety Analysis is completed and transmitted on the ICS 201-5. The Glennallen Response Base and Valdez fire trucks arrive on-site.	The Mobile Command Post with the "Go Team" arrives to provide support services.	
Discharge Tracking	Initial helicopter over flight (by Glennallen Response Base/PS11 helicopter) indicates that oil discharge is declining but leading edge is moving toward (and entering) the Little Tonsina River to the east of the pipe break.		Discharge tracking by air and ground ensures that continuous monitoring occurs until containment is established and threat to Tonsina River is over. Valdez helicopter arrives on-site at T + 3 hours to support aerial tracking and resource mobilization.		

TABLE LTONS.1 (CONTINUED) LITTLE TONSINA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0600-0700)	Hour 1-3 Day 1 (0700-0900)	Hour 3-5 Day 1 (0900-1100)	Hour 5-12 Day 1 (1100-1800)	Night Shift (Hour 12-24) Day 1 (1800-2400); Day 2(0000-0600)
Protection of Environmentally Sensitive Areas (ESAs)	The Little Tonsina River is an important anadromous fish stream that provides spawning and rearing habitat for Coho and Chinook salmon. It is sensitive to disturbance all year, with the least sensitive period occurring in March through May. The Little Tonsina Flats wetland areas are also an important rearing habitat for Coho salmon, most sensitive during August. Other environmentally sensitive areas and areas of public concern s identified in the vicinity of the hypothetical release point include eagle nest sites located approximately 2 miles north and reported subsistence plant harvest areas, In addition, there is the (b) (7)(F), (b) (3) Site and a scenic area at PS12 within one-half mile of the hypothetical release point. ESAs within spill path are identified and response tactics identified to minimize impacts. ESAs outside of spill path (on land) are identified and travel routes are established to reduce impacts. Locations of ESAs are communicated in ICS 201 and 204's as well as various briefings.				
Response Actions	The regional OC assumes the position of Initial Incident Commander and the Glennallen Response Base P&CM RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Valdez IMT and transitions to the position of Deputy Operations Section Chief. The Valdez Emergency Operations Center (VEOC) is established..				
Staging Areas	Staging areas are identified both north and south of the spill site. North staging area (SA-1) is located at the large gravel pit on the access road at CS11-6. South staging area (SA-2) is located at the pad located at (b) (7)(F), (b) (3) . Ahtna requested to supply teamsters and laborers to support logistics and staging.		Staging area 1 (SA-1) is established and operational. Forklift and loader (Table LTONS.7) arrive to support staging.	Staging area 2 (SA-2) is established and operational.	Mobile Command Post (MCP) arrives from Fairbanks Response Base and is at SA-1 to provide an on-site command and communications center.
Task Force 1 **Highway Closure and Containment of Oil at CS11-7 (Richardson Highway Culvert)**	The GRT/TF-1 (5 responders). Three of the GRT/TF-1 responders are mobilized via helicopter with culvert blocking materials and traffic control kit to establish containment at CS11-7 and close the Richardson Highway to traffic. The leading edge of the oil reaches the Richardson Highway crossing at T + 55 min. The remaining two GRT/TF-1 responders mobilize to the site via vehicle.	The three GRT/TF-1 responders and culvert blocking materials and traffic control kit arrive on Bell 206L and beginning to block the culvert and close the road, and containment activities begin at T+70. A second culvert blocking kit and barricade kit are pre-staged at CS11-7. The remaining two responders arrive by T+2 hours.	Alaska State Troopers and Alyeska Security arrive and take over the duties of site security. TF-1 goes to SA-1 to await arrival of spill response equipment. Containment and recovery equipment arrives at T + 3 hours.	TF-1 returns to CS11-7 and to the Richardson Highway culvert. Initial containment and recovery operations with equipment brought down from Glennallen Response Base by TF-2 and Fastanks and bladders listed in Table LTONS.7 begin. Culvert block is adjusted as water height increases and oil is lifted away from the bottom of the culvert. One Desmi 250 skimmer is deployed at the highway crossing along with four, 5,000-gal Fastanks. Two additional bladders are placed on the highway roadbed for storage. Recovery begins at T + 10 hr.	Mutual Aid (5) arrive on-site and take over containment and recovery operations for TF-1.
Task Force 2 **Containment of Oil at PLMP 733**	The GRT/TF-2 (5 responders) is mobilized by road to stage at SA-1.	GRT/TF-2 arrives at SA-1 and prepares for deployment. Initial responders and response equipment Table LTONS.4) are transported by road to (b) (7) and arrive at T + 3 hours.	GRT/TF-2 places containment boom in multiple deflection sets along the river, as well as set up multiple Fastanks and 2 Aquaguard skimmers. Leading edge of the oil that escaped the Richardson Highway containment arrives at (b) (7)(F), + 3 hr 44 min.	Additional, precautionary boom sets are placed in the immediate area downstream to prevent oil migration beyond the containment site area. Two Desmi 250 skimmers are set in the first booms to come in contact with the oil. Recovery begins at T + 6 hr.	Mutual Aid (5) arrive on-site and take over containment and recovery operations for TF-2.
Task Force 3 **Containment and Recovery at Pipeline Break and Adjoining Pad**		SERVS/TF-3 (8 responders) is mobilized from Valdez with equipment shown in Table LTONS.5 and arrive at T + 3 hours. .	They assist with establishment of SA-2 and traffic control and establish air monitoring, containment, and recovery operations.	Hot zone established and TF-3 begins initial assessment of pipeline ROW and pad impacts near the break. TF-3 begins recovery of pooled oil and installation of water-filled boom to prevent oil migration across land. Vikoma Shore vac and two Aquaguard skimmers are installed to pick up oil in small pools and trench along ROW.	ACS (5) and Mutual Aid (5) arrive on-site and take over containment and recovery operations for TF-3. SERVS/TF-3 (8) will shift task efforts to delineation of oil off pad at Hour T+24.
Task Force 4 **Containment of Oil at CS11-6 and Sites of Opportunity Downstream**		Delta Response Base TF-4 (5 responders) is mobilized to SA-1 with resources shown in Table LTONS.6. They are directed to stop in Glennallen Response Base and pick up additional equipment trailers (Table LTONS.6).		TF-4 arrives at SA-1 at T + 5 hours with equipment from the Delta Response Base and Glennallen Response Base. TF-4 deploys containment boom and Aquaguard skimmers at 2 locations (CS11-6 and nearby). No oil is predicted to reach these sites due to the distance from the spill, so deployment is precautionary only.	CCI (2) arrive on-site and take over containment for TF-4.
Task Force 5 **Assist With Recovery Operations at CS11-7 (Richardson Highway Culvert)**					ACS (5)/TF-5 arrives at SA-1. As additional oil storage and Aquaguard skimmers arrive from PS10, ACS (5)/TF-5 departs to CS11-7 (Richardson Highway culvert) to assist TF-1. Recovery begins at T + 15 hr.

TABLE LTONS.1 (CONTINUED) LITTLE TONSINA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0600-0700)	Hour 1-3 Day 1 (0700-0900)	Hour 3-5 Day 1 (0900-1100)	Hour 5-12 Day 1 (1100-1800)	Night Shift (Hour 12-24) Day 1 (1800-2400); Day 2(0000-0600)
Task Force 6 **Assist TF-3 With Recovery Operations Near Pipe Break and on Pad/Tundra**		Fairbanks Initial Response Team (IRT)/TF-6 (6 responders) mobilizes to depart Fairbanks Response Base and head to SA-1 with available portable storage tanks shown in Table LTONS.7.	Fairbanks IRT/TF-6 departs Fairbanks Response Base.	Fairbanks Response Base/TF-6 arrives at SA-1. Crew, portable storage, and other equipment are transported by road to SA-2 and deployed to assist TF-3 with containment and recovery on the south end of the spill.	CCI (6) arrive and take over recovery operations for TF-6.
Task Force 7 **Management of Recovered Oil Storage**		Fairbanks SRT/TF-7 (7 responders) mobilizes to depart Fairbanks Response Base and head to SA-1 with available portable storage tanks.	Fairbanks IRT/TF-7 departs Fairbanks Response Base with available portable tanks. Three vac trucks arrive from Valdez at T + 3 hr. Additional 300-bbl vac trucks are requested from Prudhoe Bay by the IMT and plans are underway to transport to SA-1 and SA-2.	Fairbanks Response Base/TF-7 arrives at SA-1 and is assigned to manage the recovered oil tank farm located at the gravel pit alongside SA-1. Vac trucks depart from Prudhoe Bay.	Mutual Aid (5) arrive and take over management of recovered oil storage at SA-1. Vac trucks are used to transport recovered oil from portable storage tanks to SA-1 where the oil is transferred to tanker trucks for transport to Valdez or PS09 for re-injection. IMT begins development of plans for disposal of recovered oil. Plans call for storage at SA-1 until the highway is re-opened for transport to Valdez and if needed, transport to PS09 for re-injection.
Task Force 8 **Wildlife Protection/ Rehabilitation** **Mobile-between TF-3 and TF-7**		The Wildlife Protection and Rehabilitation Plan is activated (also see Protection of ESAs above). Environment Unit mobilizes 10 wildlife hazers from CCI and requests them to mobilize the Fairbanks wildlife treatment center.	Environment Unit contacts ACS and SERVS, which are placed on standby for the poss ble use of their wildlife response facilities or provision of additional hazing and/or capture and treatment equipment.	IBRRC (Berkeley, CA) are notified and requested to establish wildlife hazing, treatment, and stabilization facilities. Treatment center in Anchorage is put on standby.	CCI hazers arrive on-site at T + 12 hours with the Fairbanks wildlife treatment center.
Additional Resources for Containment and Recovery		Responders are mobilized from ACS (10 responders), Mutual Aid (20 responders) and CCI (8 responders) to provide additional support and night shift relief crews. Additional resources for containment and recovery including tanks, temporary storage, pumps, skimmers, and heavy equipment that will be used by TF-1 through TF-7 shown in Table LTONS.7 is mobilized by logistics personnel from various locations. Equipment begins arriving at T + 3 hours.	ACS (TF-5) departs Prudhoe Bay with 12, 2,500-gal Fastanks and 2, 3,000-gallon bladders.		Responders arrive at T + 12 hours from ACS, Mutual Aid, and CCI to take over night shifts. Responder arrival and tasks are detailed in each Task Force description.
Waste Management			Dump trucks arrive on-site to transport solid waste.	Solid waste will be segregated and placed into clear bags. Waste will be segregated as follows: 1. Waste to landfill 2. Oily waste 3. Heavily oiled waste (>50%) Contaminated soil which is confirmed as hazardous waste must be managed as such and containerized in RCRA storage containers. Non-hazardous contaminated soil will be stockpiled in an approved lined secondary containment area. This soil will be thermally remediated on site.	As the spread of oil is secured, the transport of recovered oil and oily debris will become an added focus of the Incident Action Plan.
Shoreline Clean-up Plan	Shoreline impacts are limited to the banks of the Little Tonsina River and the ponded area upstream of the Richardson Highway.				

TABLE LTONS.1 (CONTINUED) LITTLE TONSINA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 24-36) Day 2 (0600-1800)	Night Shift (Hour 36-48) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)
Situation/Status • **Weather** • **Environmental**	Late summer, (August). Temperature 63°F Wind from the north at 10 mph. River speed is 1.7 feet per second					
Objectives and Strategies[1]	**Objectives**	**Strategies**				
	Continue to emphasize responder safety and effectiveness.	Continuous air monitoring of all operations within oiled and downwind zones. Observe proper rest cycles.				
	Prevent oil from moving past PLMP 733 containment site.	Install additional deflection booms and ensure that sufficient recovery and storage systems are in place.				
	Minimize impacts to non-oiled vegetation and waters.	Establish and communicate proper egress routes to all areas. Continue to communicate ESA information to all teams.				
	Maintain effective communications with agencies, affected communities, and stakeholders.	Continue Unified Command throughout response; establish standing communication cycle with public and stakeholders.				
	Evaluate feasibility and timeline for damage assessment and repair of pipeline.	Assemble team and analyze site and structural data. Work with response management to ensure that response and re-start are compatible activities.				
Fire Prevention, Control, and Safety	Continue to monitor LEL and wind direction. Maintain adequate fire and medical watch at all response sites and communicate changes immediately to Alyeska Safety and Team Leaders.	Continue ongoing evaluation of LEL, responder work cycles, and ergonomics.				
Discharge Tracking	Discharge tracking continues to occur via aerial observation and ground reports from teams at containment sites. With the closure of the culverts at the Richardson Highway crossing of the Little Tonsina and the establishment of containment sites (b) (7)(F), , CS11-6, and sites of opportunity downstream from CS11-6, no oil enters the Tonsina River.					
Protection of Environmentally Sensitive Areas (ESAs)	ESAs continue to be evaluated and necessary mitigation steps put in place to eliminate/minimize impacts. Locations of existing and any new sites, as well as progress, are communicated at shift change briefings or as needed.					
Task Force 1 **Containment of Oil at CS11-7 (Richardson Highway Culvert)**	GRT (5)/TF-1 continues to install containment boom to concentrate oil for recovery and minimize impact to the shore area of the pond forming as a result of the culvert block, and continues to recover oil. Another Desmi 250 skimmer is placed in the oil and recovery begins at T + 30 hr.	Mutual Aid (5)/TF-1 continues to recover oil, and monitor boom configuration and water depth. Additional temporary storage is added to increase ability to hold oil on-site as tank farm at SA-1 is established.	GRT (5)/TF-1 continues to recover oil, and monitor boom configuration and water depth.	Mutual Aid (5)/TF-1 continues to recover oil, and monitor boom configuration and water depth.	GRT (5)/TF-1 continues to recover oil, and monitor boom configuration and water depth.	
Task Force 2 **Containment of Oil at (b) (7)(F), (b) (3)**	GRT (5)/TF-2 installs additional containment boom and 3 Aquaguard skimmer systems to ensure that oil is recovered in the immediate area and does not migrate to CS11-6. Three 5,000-gallon Fastanks are set up with the skimmers. Recovery begins at T + 24 hr.	Mutual Aid (5)/TF-2 continues to recover oil and monitor boom configuration. Additional temporary storage is added on the pad at (b) (7) to increase ability to hold oil on-site as tank farm at SA-1 is established. Two more Aquaguard skimmers are placed in booms. Recovery begins at T + 33 hr.	GRT (5)/TF-2 continues to recover oil and monitor boom configuration.	Mutual Aid (5)/TF-2 continues to recover oil and monitor boom configuration.	GRT (5)/TF-2 continues to recover oil and monitor boom configuration.	

TABLE LTONS.1 (CONTINUED) LITTLE TONSINA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 24-36) Day 2 (0600-1800)	Night Shift (Hour 36-48) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)
Task Force 3 **Containment and Recovery at Pipeline Break and Adjoining Pad**	SERVS (8)/TF-3 continue to delineate oil spread off pad. Non-mechanical containment such as shore boom and trenching/sandbagging occur to minimize spread of oil to the Little Tonsina River, on pad, and on adjoining tundra. Oil that is recoverable from tundra is collected and stored in temporary storage southwest of the pad/pipe break and on former PS12 pad.	ACS (5) and Mutual Aid (5)/TF-3 continue to contain and recover oil using non mechanical containment such as shore boom and trenching/sandbagging to minimize spread of oil to the Little Tonsina River, on pad, and on adjoining tundra. Oil that is recoverable from tundra is collected and stored in temporary storage southwest of the pad/pipe break and on former PS12 pad.				
Task Force 4 **Containment of Oil at 11-6 and Sites of Opportunity Downstream**	Since oil never reaches containment site, it is left in place and managed by minimal staff. This staff also acts as road control for access to SA-1 and adjoining tank farm.	CCI (2) maintain and monitor containment site and assist with site control access to SA-1.	Stand down of CCI crew and re-assignment of staff. Equipment is left in place and monitored through the shift by security at entry to staging area.	TF-4 crew is distributed amongst activities such as recovery at CS11-7 (Richardson Highway culvert) and the pad area.		
Task Force 5 **Assist With Recovery Operations at CS11-7 (Richardson Highway Culvert)**	Mutual Aid(5)/TF-5 continues to support recovery operations, containment boom installation, and water management at CS11-7 (Richardson Highway culvert). Pumps are installed to move water over the Richardson Highway from upstream so that additional fine-tuning of the newly formed pond can occur. Recovery with an additional Aquaguard skimmer begins at T + 21 hr.	ACS (5)/TF-5 installs additional pumps and transfer systems to assist with moving recovered oil out of temporary storage and away from containment site. TF-5 continues to assist TF-2 in recovering oil from ponded area with the addition of 1 more Aquaguard skimmer. Recovery begins at T + 31 hr.	Mutual Aid(5)/TF-5 continues to support recovery operations, containment boom installation, and water management at CS11-7 (Richardson Highway culvert). Efforts begin to recover oil at the culvert system at the ROW crossing of the Little Tonsina and transport the oil up the ROW to the north.	ACS (5)/TF-5 conducts ongoing recovery of oil and management of water behind the culverts. Brush and other debris continue to be removed as needed and additional recovery systems are used if required.	Mutual Aid (5)/TF-5 continues work to transport oil by river current and deflection boom to recovery systems located along the banks of the pond. Additional responders from TF-4 are distributed as needed.	ACS(5)/TF-5 continues work to transport oil by river current and deflection boom to recovery systems located along the banks of the pond.
Task Force 6 **Assist TF-3 With Recovery Operations Near Pipe Break and on Pad/Tundra**	Fairbanks IRT (6)/TF-6 provides primary assistance to TF-3 by continuing to isolate and remove oil from the pipeline pad and adjoining tundra to the east of the pipe. Team moves to place shore guardian boom along low spots in the tundra rise along the stream where oil can migrate to the water.	CCI (6)/TF-6 continues to isolate and remove oil from the pipeline pad and adjoining tundra to the east of the pipe. Entry points to the oil off the pad continue to move north along the PS12 pad as air monitoring indicates a drop in LEL.	Fairbanks IRT (6)/TF-6 provides primary assistance by continuing to isolate and remove oil from the pipeline pad and adjoining tundra to the east of the pipe. Team continues to place shore guardian boom along low spots in the tundra and isolate pockets of ponded oil. Brush removal continues.	CCI (6)/TF-6 establishes new routes off the bluff of the pad and into the tundra for removal of gross oil contamination. As air monitoring indicates it is acceptable. Plans are reviewed to section off the tundra into portions that can be flooded and washed for continuous oil removal.	Fairbanks IRT (6)/TF-6 continues to work on gross oil removal, brush and access issues and installation of barriers to prevent any oil migration beyond immediate area. Recovery of oil on pad continues.	CCI (6)/TF-6 continues to work on gross oil removal, brush and access issues, and installation of barriers to prevent any oil migration beyond immediate area. Recovery of oil on pad continues.
Task Force 7 **Management of Recovered Oil**	Fairbanks SRT (7)/TF-7 vac trucks are used to transport recovered oil from portable storage tanks to SA-1 where the oil is transferred to tanker trucks for transport to Valdez or PS09 for re-injection.	Mutual Aid (5)/TF-7 continues to load recovered oil from all task forces in tanker trucks for transport and reinjection in Valdez or PS09.				
Task Force 8 **Wildlife Protection/ Rehabilitation** **Mobile-between TF-3 and TF-7**	IBRRC arrives on site and manages bird hazing, capture, and stabilization.					
Waste Management	Continue waste disposal plan. Increase manpower as waste stream volume increases.	Begin consolidation of waste by type. Ensure drainage of waste into liner is addressed to preclude risk of overflow from rain and leak potentials.	Refine waste disposal plan to address in more detail the long-range disposal strategy. Options to dispose of waste include off-site disposal and storage capacities.	Waste management operations continue until complete.		

TABLE LTONS.1 (CONTINUED) LITTLE TONSINA RIVER SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Day Shift (Hour 24-36) Day 2 (0600-1800)	Night Shift (Hour 36-48) Day 2 (1800-2400); Day 3 (0000-0600)	Day Shift Day 3 (0600-1800)	Night Shift Day 3 (1800-2400); Day 4 (0000-0600)	Day Shift Day 4 (0600-1800)	Night Shift Day 4 (1800-2400); Day 5 (0000-0600)
Shoreline Clean-up Plan	Shoreline impacts change only in the area of the developing pond near the highway. Begin organizing Shoreline Cleanup Assessment Team (SCAT).		Shoreline impacts appear to be limited to those stream banks (b) (7)(F), (b) . Water height in the pond created at the Richardson Highway is stabilized and booms have been placed to minimize impact to the shore of the pond. Mobilize SCAT.	During the days that follow, clean-up activities focus on oil still on the water and on preventing any more oil entering from off of the tundra.	Over a period of about 2 weeks, the streambank cleanup crews recover about one-half of the oil volume estimated onshore following completion of initial recovery efforts. **SCAT Deployed:** Oil remaining trapped in widely scattered pockets in the on-land area of the initial release will be dealt with during the long-term cleanup. An option for recovering this oil would be to flood the area now contained in earth berms with water to float the oil. The floated oil would be corralled in containment booms and skimmed off the water. During the days that follow, cleanup activities focus on the oil remaining along the shoreline. These efforts are cleared and approved by the State On-Scene Coordinator, and shoreline cleanup efforts are aimed at areas of contamination where free oil can be absorbed or recovered with minimal disturbance of the beach/bank strata. A shoreline cleanup plan is developed by applying the SCAT process. Oiled gravel on the work pad is stored in a temporary lined area for later cleaning or incineration and reuse.	

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations of resources and other organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE LTONS.2 LITTLE TONSINA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 0600-0700								Hour 1-3 0700-0900							Hour 3-5 0900-1100						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	--	--	--	--	Traffic control kit	--	--	--	--	2	--	Traffic control kit	--	--	--	--	2	--	Traffic control kit	--	(b) (7) (F), (b) (3)	--	--
Discharge Tracking	Aerial Tracking[4]	--	--	--	--	Helicopter (1)[4]	--	--	--	--	--	--	Helicopter (1)[4]	--	--	--	--	--	--	2 helicopters (2)[4]	--		--	--
	Ground Tracking[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--
Fire Protection	Fire Protection	--	--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	1 fire foam skid (2) 1 fire truck (2)	--		--	--
Safety	Site Safety and Control[6]	--	1	1	--	--	--	--	--	--	1	--	1 Helicopter (1)	--	--	--	--	1	--	--	--		--	-- (b) (7) (F), (b) (3)
Environment	EC	--	1	1	--	--	--	--	--	--	1	--	--	--	--	--	--	1	--	--	--		--	
Containment and Recovery	Highway Closure and Contain Oil at CS11-7	TF-1	5	5	--	--	--	--	--	--	5	--	Culvert blocking material	--	--	--	--	5	Forklift (1)[8] Loader (1)[8]	Culvert blocking material Desmi 250 skimmer 500 ft boom	1		Varies	
	Closure of Culvert and Contain Oil at PLMP 733	TF-2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	5	--	2,000 ft of boom 4 Aquaguard skimmers 2 Desmi skimmers Fastanks	4 2		Varies	
	Contain and Recover Oil at Pipeline Break and Adjoining Pad	TF-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--	Shore Gardian boom Land spill trailer Vikoma shore vac 2 Aquaguard skimmers	1 2		Varies	
	Contain Oil at CS11-6 and Sites of Opportunity Downstream	TF-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

TABLE LTONS.2 (CONTINUED) LITTLE TONSINA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1 0600-0700								Hour 1-3 0700-0900							Hour 3-5 0900-1100						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Containment and Recovery (continued)	Assist With Recovery Ops at CS11-7	TF-5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
	Assist TF 3 With recovery	TF-6	--	--	--	--	--	--	--	--	--	--	--	---	--	--	--	--	--	--	--	--	--	--
Recovered Oil Storage	Manage Recovered Oil Storage	TF-7	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	3 ea. 100-bbl vac trucks (3)	--	--	--	--	--
Wildlife	Wildlife Protection and Rehabilitation	TF-8	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Waste Management	Waste Management	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	2 dump trucks (2)	--	--	--	--	--
On-Scene Comms.	Communication Support	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Personnel Total			Note[7]	7	--	1					9	--	2					24	7	6				
Mechanical Equipment Total					--	1						--	2						7	15				

TABLE LTONS.2 (CONTINUED) LITTLE TONSINA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-12 1100-1800								Hour 12-24 1800-0600							Hour 24+ 0600+						
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	--	2	2	--	Traffic control kit	--	--	--	--	2	--	Traffic control kit	--	--	--	--	2	--	Traffic control kit	--	(b) (7)(F), (b)(3)	--	(b) (7)(F), (b)(3)
Discharge Tracking	Aerial Tracking[4]	--	--	--	--	2 helicopters (2)[4]	--	--	--	--	--	--	2 helicopters (2)[4]	--	--	--	--	--	--	2 helicopter (2)[4]	--		--	
	Ground Tracking[5]	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	
Fire Protection	Fire Protection	--	--	--	--	1 fire foam skid (2) 1 fire truck (2)	--	--	--	--	--	--	1 fire foam skid (2) 1 fire truck (2)	--	--	--	--	--	--	1 fire foam skid (2) 1 fire truck (2)	--		--	
Safety	Site Safety and Control[6]	--	1	1	--	--	--	(b) (7)(F), (b)(3)	--	(b) (7)(F), (b)(3)	1	--	--	--	--	--	(b) (7)(F), (b)(3)	1	--	--	--		--	
Environment	EC	--	1	1	--	--	--		--		1	--	--	--	--	--		1	--	--	--		--	
Containment and Recovery	Highway Closure and Contain Oil at CS11-7	TF-1	5	5	Forklift (1)[8] Loader (1)[8]	Culvert blocking material Desmi 250 500 ft of boom	1		4 2		5 + 5 night shift	Forklift (1)[8] Loader (1)[8]	Culvert blocking material Desmi 250 500 ft of boom	1	88	4 2		5 + 5 night shift	Forklift (1)[8] Loader (1)[8]	Culvert blocking material 500 ft of boom 2 Desmi 250	2		4 2	
	Closure of Culvert and Contain Oil at (b) (7)	TF-2	5	5	--	2,000 ft of boom 4 Aquaguard skimmers 2 Desmi 250 Fastanks	4 2		Varies		5 + 5 night shift	--	2,000 ft of boom 7 Aquaguard skimmers 2 Desmi 250 Fastanks	7 2	329 total 176 total	Varies 3		5 + 5 night shift	--	2,000 ft of boom 7 Aquaguard skimmers 2 Desmi 250 Fastanks	7 2		3	
	Contain and Recover Oil at Pipeline Break and Adjoining Pad	TF-3	10	10	--	Shore Gardian boom Land spill trailer Vikoma Shore vac 2 Aquaguard skimmers	1 2		Varies		10 + 10 night shift	--	Shore Gardian boom Land spill trailer Vikoma Shore vac 2 Aquaguard skimmers	1 2	10 94 total	Varies		10 + 10 night shift	--	Shore Gardian boom Land spill trailer Vikoma Shore vac 2 Aquaguard skimmers	1 2		Varies	
Containment and Recovery (continued)	Contain Oil at CS11-6 and Sites of Opportunity Downstream	TF-4	5	5	--	2,000 ft of boom 2 ea. 45-ft response trailers 2 Aquaguard skimmers	2		--		5 + 2 night shift	--	2,000 ft of boom 2 ea. 45-ft response trailers 2 Aquaguard skimmers	2	94 total	--		5 + 2 night shift	--	2,000 ft of boom 2 ea. 45-ft response trailers 2 Aquaguard skimmers	2		--	
	Assist With Recovery Ops at CS11-7	TF-5	--	--	--	2 Aquaguard skimmers	2		--		5 + 5 night shift	--	Fastanks Bladders 2 Aquaguard skimmers	2	94 total	12 2		5 + 5 night shift	--	Fastanks Bladders 2 Aquaguard skimmers	2		12 2	
	Assist TF 3 With Recovery	TF-6	6	6	--	Portable tanks	--		Varies		6 + 6 night shift	--	--	--	--	Varies		6 + 6 night shift	--	--	--		Varies	
Recovered Oil Storage	Manage Recovered Oil Storage	TF 7	7	7	3 ea. 100-bbl vac trucks (3)		--				7 + 5 night shift	3 ea. 100-bbl vac trucks (3) 5 ea. 300-bbl vac trucks (5)	Portable tanks	--	--	Varies		7 + 5 night shift	3 ea. 100-bbl vac trucks (3) 5 ea. 300-bbl vac trucks (5)	Portable tanks	--		Varies	

TABLE LTONS.2 (CONTINUED) LITTLE TONSINA RIVER SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 5-12 1100-1800								Hour 12-24 1800-0600							Hour 24+ 0600+					
			People for Setup[1,2]	People for Ops[1,2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Wildlife	Wildlife Protection and Rehabilitation	TF 8	--	--	--	--	--	--	--	--	10 CCI	--	Wildlife treatment center	--	--	--	--	10 CCI 10 IBRRC	--	Wildlife treatment center	--	--	--	--
Waste Management	Waste Management	--	--	--	2 dump trucks (2)	--	--	--	--	--	--	2 dump trucks (2)	--	--	--	--	--	--	2 dump trucks (2)	--	--	--	--	--
On-Scene Comms.	Communication Support	--	--	--	--	Mobile Command Post (12)	--	--	--	--	--	--	Mobile Command Post	--	--	--	--	--	--	Mobile Command Post	--	--	--	--
Personnel Total			Note[7]	42	7	--					95	12	6					105	12	6				
Mechanical Equipment Total					7--	21						12	25						12	26				

[1] Number of people excludes State or Federal representatives in the organization. Not all individuals would be on incident full-time.

[2] Operation of a tactic may require fewer people than setup.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can assess the site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing setup of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

– Not arrived on site. May be mobilized or en route.

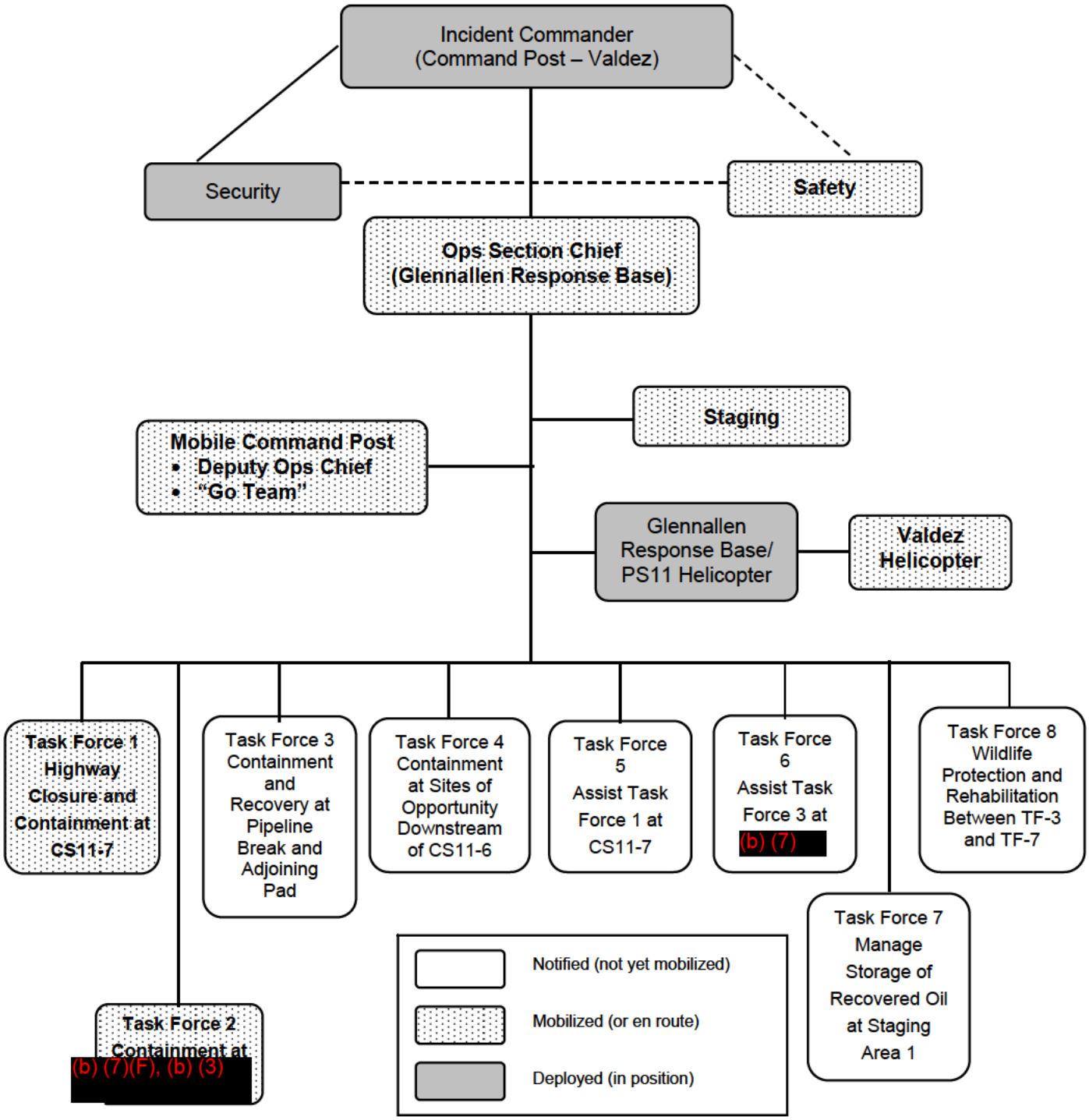


FIGURE LTONS.3
LITTLE TONSINA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

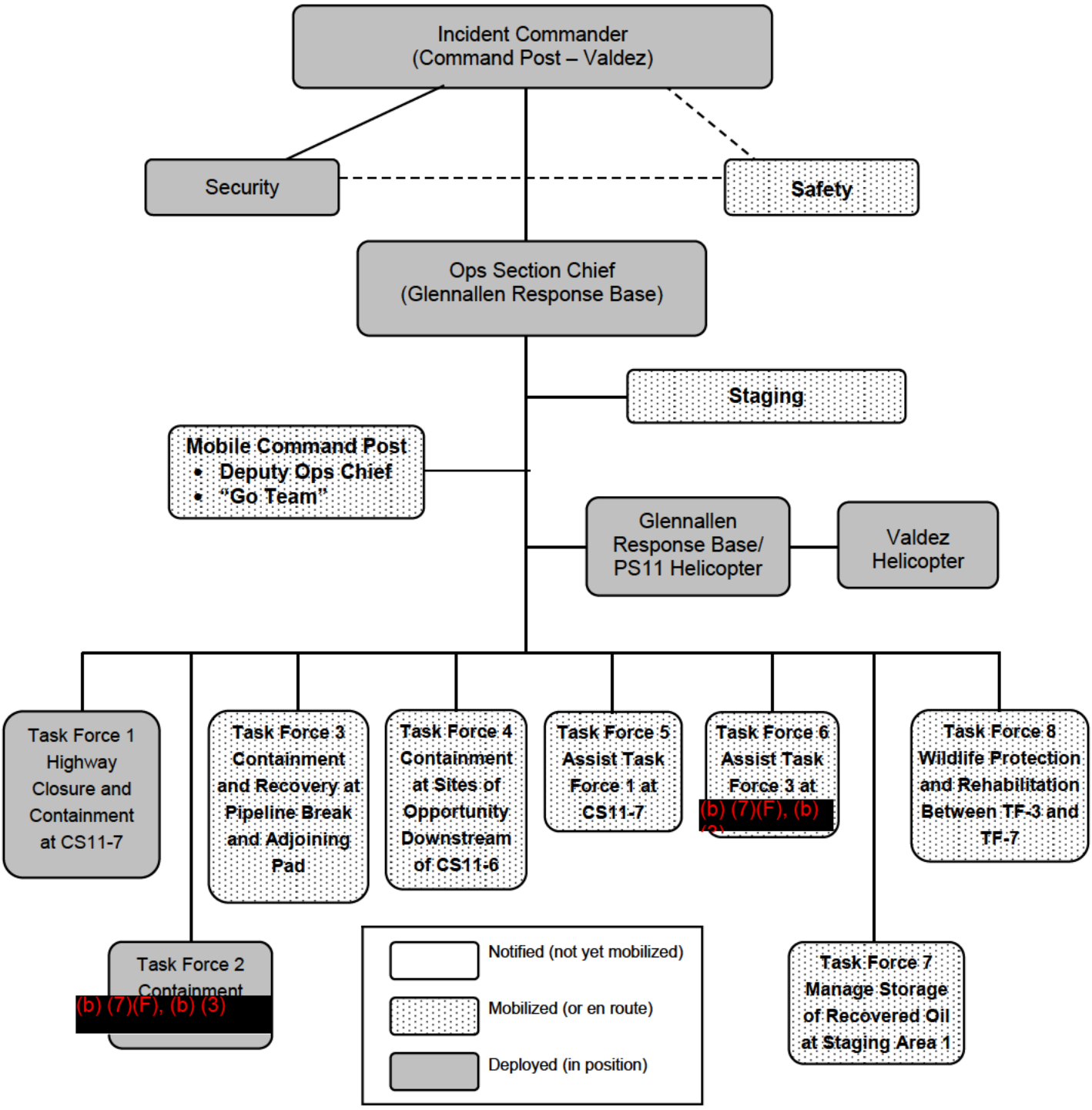


FIGURE LTONS.4
LITTLE TONSINA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

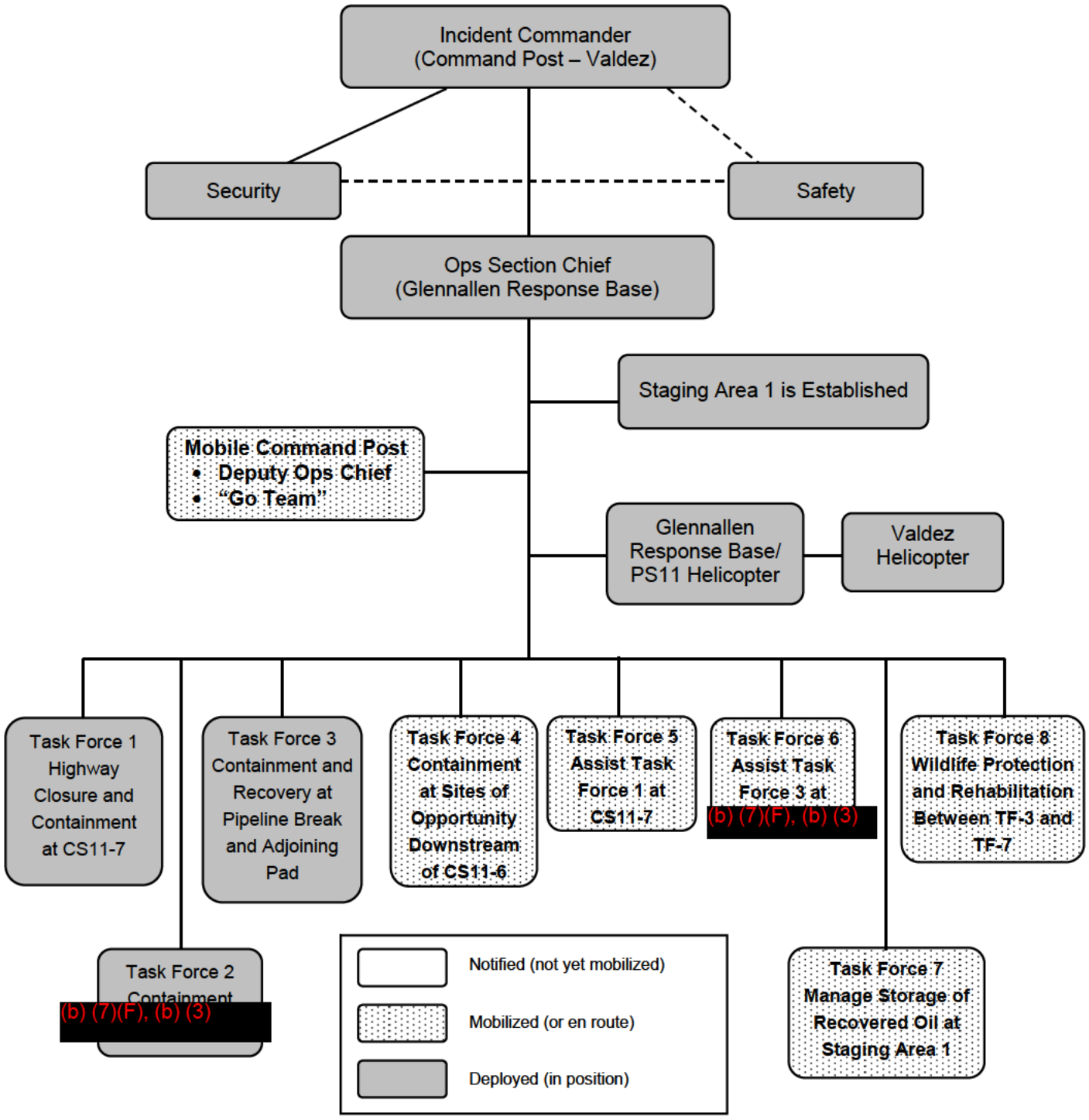


FIGURE LTONS.5
LITTLE TONSINA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-5

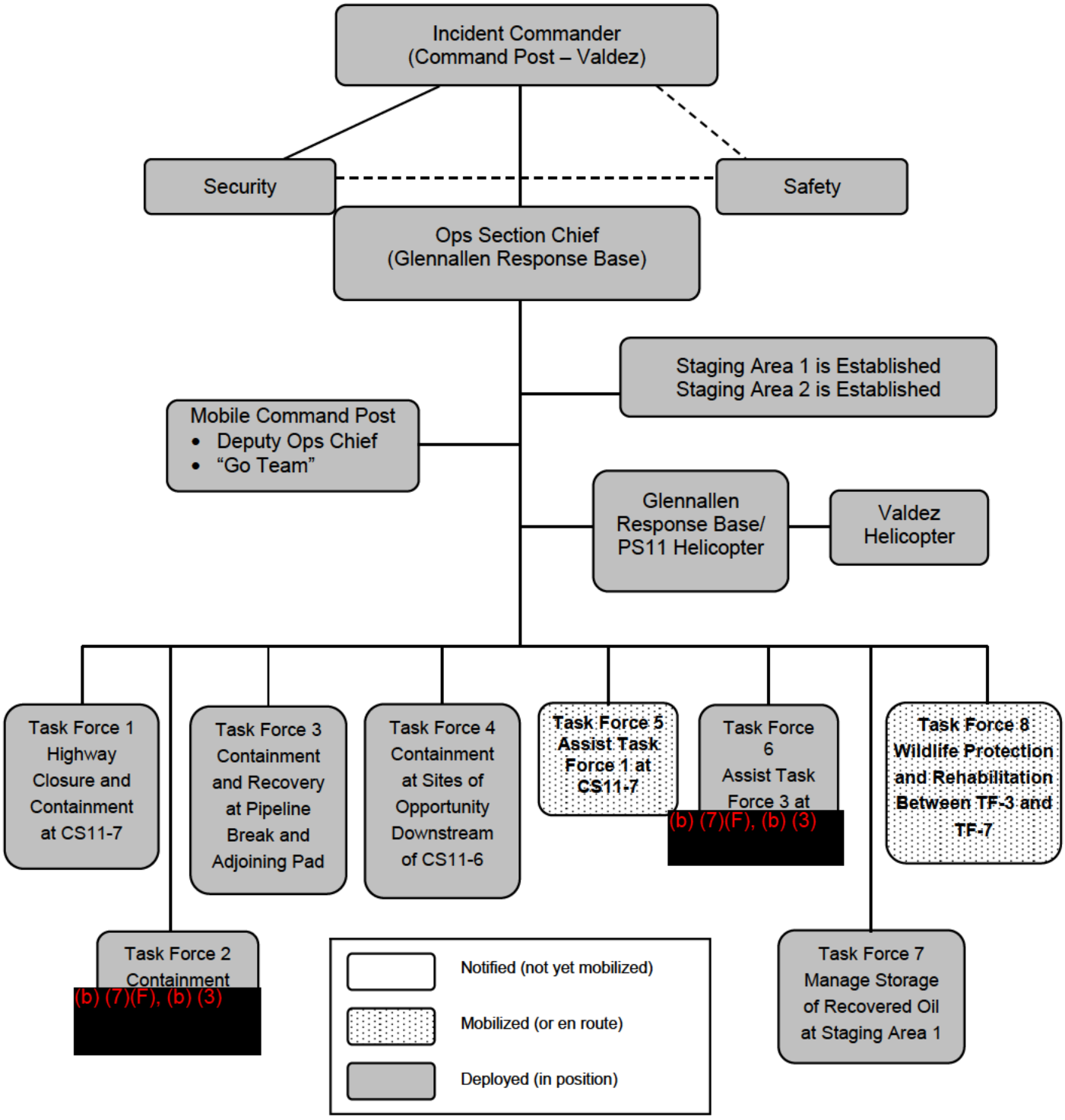


FIGURE LTONS.6
LITTLE TONSINA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 5-12

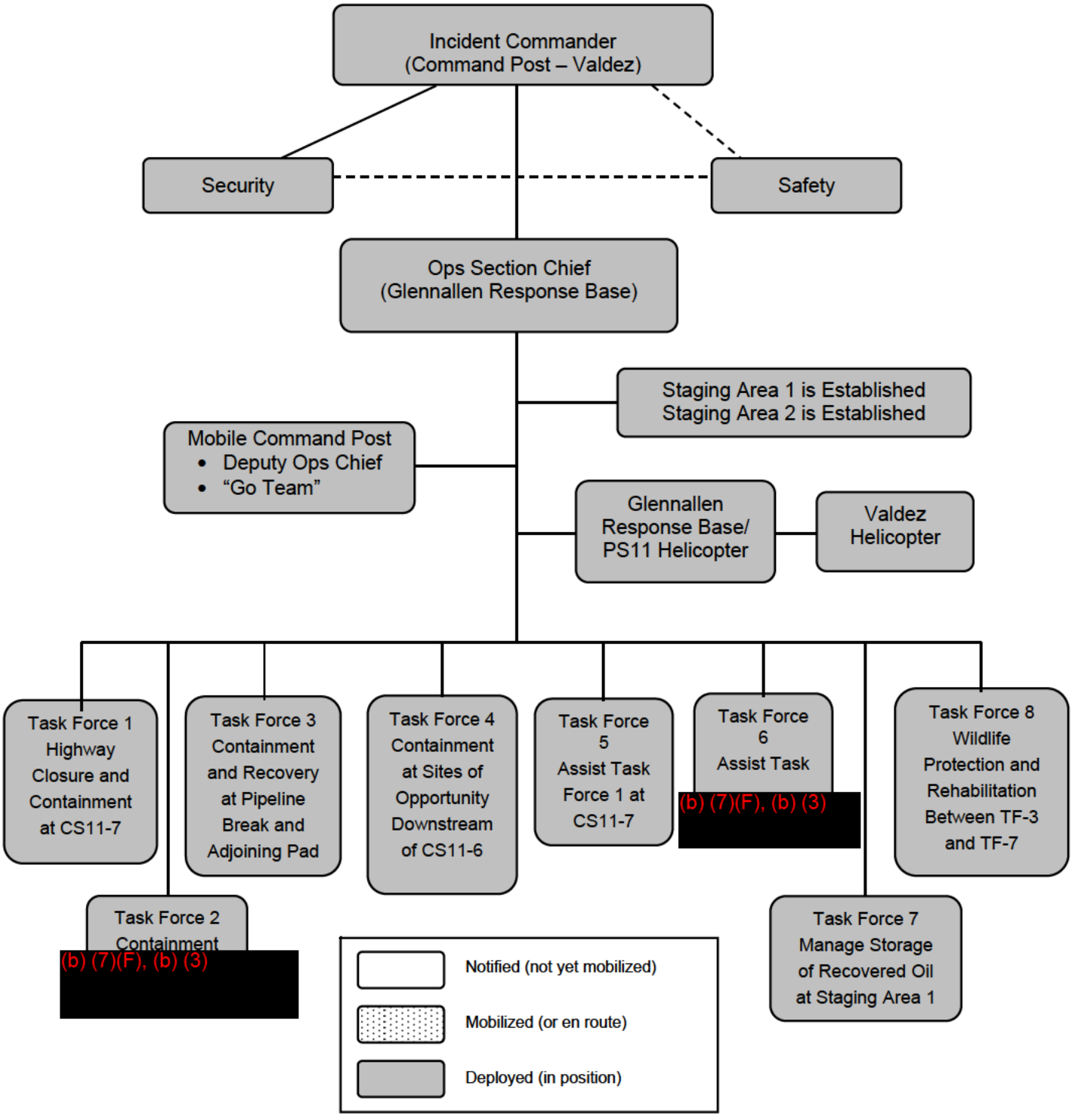


FIGURE LTONS.7
LITTLE TONSINA RIVER SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 12-24

TABLE LTONS.3 LITTLE TONSINA RIVER SCENARIO
RESOURCE MOBILIZATION FOR HWY CLOSURE AND CONTAINMENT AT CS11-7

Equipment/Personnel (Quantity)	Location	Purpose	ETA On-Site
Culvert blocking materials (from lumber pallet)	Glennallen Response Base	Block Culvert at CS11-7	T + 55 min
Traffic control kit	Glennallen Response Base	Safety of road closure activities	T + 55 min
Responders – GRT/TF-1 (3)	Glennallen Response Base	Highway closure and oil containment	T + 55 min
Responders – GRT/TF-1 (2)	Glennallen Response Base	Highway closure and oil containment	T + 2 hr
Helicopter (1)	Glennallen Response Base	Crew transport and over flight	T + 55 min
Desmi 250 skimmer	SERVS	Recovery	T + 3 hr
500 feet of boom	Glennallen Response Base	Containment	T + 3 hr

TABLE LTONS.4 LITTLE TONSINA RIVER SCENARIO RESOURCE MOBILIZATION FOR CONTAINMENT AT PLMP 733

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Responders - TF-2 (5)	Glennallen Response Base	Containment and recovery	T + 3 hr
Boom (2,000 ft)	Glennallen Response Base	Containment and recovery	T + 3 hr
Aquaguard skimmers (4)	Glennallen Response Base	Recovery	T + 3hr
Aquaguard skimmer (3)	Fairbanks Response Base	Recovery	T + 7 hr
Desmi 250 skimmers (2)	SERVS	Recovery	T + 3 hr

TABLE LTONS.5 LITTLE TONSINA RIVER SCENARIO RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY AT PIPELINE BREAK AND ADJOINING PAD

Equipment/Personnel (Quantity)	Location	Purpose	ETA On-Site
Responders – TF-3 (8)	Valdez/SERVS	Containment and recovery	T + 3 hr
Land Spill Trailer – 20-ft (1)	Valdez	Equipment and response support	T + 3 hr
Vikoma Shore vac	Valdez	Recovery	T + 3 hr
Aquaguard skimmers (2)	Valdez	Recovery	T + 3 hr
Shore Gardian boom (1,000 ft)	Valdez	Containment	T + 3 hr
Glennallen Response Base fire foam skid (1)	Glennallen Response Base	Fire prevention and control	T + 3 hr
Valdez fire truck (1)	Valdez	Fire prevention and control	T + 3 hr
Firefighters (4)	Valdez	Fire prevention and control	T + 3 hr

TABLE LTONS.6 LITTLE TONSINA RIVER SCENARIO RESOURCE MOBILIZATION FOR CONTAINMENT AT SITES OF OPPORTUNITY DOWNSTREAM OF CS11-6

Equipment/Personnel (Quantity)	Location	Purpose	ETA On-Site
Responders – TF-4 (5)	Delta Response Base	Containment and recovery	T + 5 hr
Response trailer – 45-ft (2)	Glennallen Response Base	Equipment and response support	T + 5 hr
Boom (2,000 ft)	Delta Response Base	Containment	T + 5 hr
Aquaguard skimmers (2)	Delta Response Base	Recovery	T + 5 hr

TABLE LTONS.7 LITTLE TONSINA RIVER SCENARIO
ADDITIONAL RESOURCE REQUIREMENTS FOR CONTAINMENT AND RECOVERY

Equipment/Personnel (Quantity)	Location	Purpose	ETA
Responders (20) shift relief	Mutual Aid	Spill response/support	T + 12 hr
Responders – shift relief (10)	ACS	Spill response/support	T + 12 hr
Responders – shift relief (8)	CCI	Spill response/support	T + 12 hr
Responders – TF-6 and TF-7 (13)	Fairbanks Response Base	Spill response/support	T + 7 hr
Frac tanks	North Slope /ACS	Storage of recovered oil	T + 19 hr
Fastanks/bladders (250,000 gallons)	Various	Storage of recovered oil	T + 3 - 12 hr
Tanker trucks (3) 10,000-12,000 gallons	Fairbanks Response Base	Transport of recovered oil	T + 12 hr
Vac trucks (3) 3,000 gallons each	Valdez	Off load portable tanks	T + 3 hr
Vac trucks (5) 300 bbl each	North Slope/ACS	Off load portable tanks	T + 19 hr
Forklift (1)	Glennallen Response Base	Staging support	T + 3 hr
Loader (1)	Glennallen Response Base	Staging support	T + 3 hr
Dump trucks (2)	Glennallen Response Base	Debris removal	T + 3 hr
Helicopter	Valdez	Transport/overflight	T + 3 hr
Aquaguard skimmers (2)	PS10	Recovery	T + 5 hr

Estimated volume of oil retained and recovered at multiple locations is summarized in Table LTONS.8. Due to the slope and terrain in the area of the pipeline break, the large area of flood plain to the east of the pipeline, and the retention capacity of the soil, most of the oil is retained on land. Depending on the time of year and amount of foliage on the ground cover, oil retention calculations will vary.

As the pressure falls within the pipe and oil tends to flow out in a more circular pattern, oil that flows to the west of the pad drains into the right-of-way (ROW) ditch and area between the ROW and Richardson Highway. This flow fills the area between the ROW and highway. The terrain also slopes to the south, so the oil travels south approximately 400 feet, turns east at the low water crossing, crosses back over the pipeline pad, and joins up with oil that originally came off the east side of the pad.

Oil that came off the east side of the pad flows southeast in a small sloped area, meets up with the oil crossing from the west, and then moves east and into the Little Tonsina River. Due to the velocity at which the oil comes down the gully, it crosses over the bank of the Little Tonsina River and spreads out

on the floodplain on the east side of the river. This fan effect spreads as the floodplain terrain allows. Oil also enters the river and moves downstream and forces water ahead of it until the force of the flow subsides and the oil begins to rise on top of the water. As the oil that spreads out over the tundra slows and thins, it is largely retained on land. Oil that enters the river moves within the stream bank and fills pockets and side channels in the stream near the highway crossing. Average stream bank height was calculated at 2 feet, so as the oil stretches out to the north, it begins to settle only in the river bed. As the culvert block raises the water level upstream of the highway, it acts to prevent oil from soaking into the soil and allows enough current to pass, to move the oil to the side of the highway

With a distance of 1,000 feet from the pipeline break to the river, it will take approximately 9 minutes for the leading edge of the oil to reach the Little Tonsina River. Approximately 11,400 barrels enter the river over the first 24 hours. With a river velocity of 1.7 feet per second, the leading edge of the oil travels approximately 4,400 river feet and reaches the Richardson Highway crossing of the Little Tonsina River at T + 50 minutes**.** The culverts are blocked at T + 70 minutes and the leading edge is cut off from the remaining oil in the river. This “plug” of oil is estimated to be approximately 8,600 barrels and the leading edge of the plug reaches the containment site at PLMP 733 at T + 3 hours 44 minutes. Initial containment activities (b) (7)(F), (b) are completed at T + 3 hours 15 minutes. As indicated in the timeline, additional boom sets are placed in this area and tankage is placed on the pad for transferring oil into larger recovery tanks. (b) (7)(F), (b) approximately one mile from the Richardson Highway crossing of the river so the 8,600 barrels that moved beyond CS11-7 stretch out as it the oil. Of the 11,400 barrels that enter the Little Tonsina, an estimated 1,000 barrels is trapped on the shorelines of the Little Tonsina between the release point and the PLMP 733 containment site. This leaves 2,300 barrels upstream of the Richardson Highway block point, and 8,100 barrels contained at (b) (7)(F), .

Note: Oil fate and modeling calculations represented in the below table do not account for emulsification of the oil, travel through a variety of soil and terrain (tundra, shrubs, trees, etc.), or cooling effects of travel in the river. Emulsification is assumed to be minimal as the Little Tonsina River has very little mixing effect in this area. Cooling effects on the oil may play a significant role in how fast the oil spreads out in the river as it travels downriver.

TABLE LTONS.8 LITTLE TONSINA RIVER SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Location	Oil Contained (bbl)	Cumulative Oil Recovered (barrels)							
		4 hr	12 hr	24 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)	[redacted]									

Scenario 14. Maximum Discharge

(b) (7)(F), (b) (3)

This scenario depicts representative oil spill response activities for an oil spill from sabotage of the pipeline between (b) (3), (b) (7)(F)

The scenario is described by seven components:

1. Introductory text
2. A deployment map depicting the site location (Figure MAXD.1)
3. Timeline matrix (Table MAXD.1)
4. Onsite resource tally sheet (Table MAXD.2)
5. Response organization charts (Figures MAXD.2 through MAXD.4)
6. Resource mobilization table (Table MAXD.3)
7. Summary of oil fate and estimated recovery (Table MAXD.4)

The first component is text that describes the type and location of the oil release, assumed conditions, and general types of response. The second component consists of a deployment map depicting containment site, task force, and staging area locations (Figure MAXD.1). The third component is a timeline matrix indicating the objectives, strategies, and tactics across the agreed upon timeframe for the scenario (Table MAXD.1). This timeline matrix is best used for seeing the objectives, strategies, and tactics for the scenario during the scenario period. The fourth component is an on-site resource tally sheet providing quantities of personnel, equipment, and capacities used in the scenario (Table MAXD.2). The fifth component is the organization structure for the scenario provided as a series of organization charts (Figures MAXD.2 through MAXD.4). The sixth component is a resource mobilization table that summarizes the equipment needed for the spill response activities, the equipment locations, and the estimated time to mobilize the equipment to the spill site (Table MAXD.3). The final (seventh) component describes the probable fate of the released oil and estimated recovery rates (Table MAXD.4).

The reader is cautioned that the organization and resources depicted in the scenario are just one way to organize resources to respond to the described oil release. Alternative combinations of equipment and organization structures could be used to meet the same set of objectives and strategies. It is understood for this scenario that the Incident Management Team (IMT) is established and is supporting the spill response. The scenario describes the operational functions of a spill response rather than the IMT.

The reader is also cautioned that this failure scenario was developed to demonstrate resources that could be used to meet the response planning standard and is not a depiction of any type of failure that would be

expected to actually occur in this system. The valves can be closed automatically and manually, making discharge of the complete pipeline system highly unlikely.

SCENARIO 14 – MAXIMUM DISCHARGE (b) (7)(F), (b) (3)	
Response Type	**Amount**
Response Planning Standard for Crude Oil Pipelines (18 AAC 75.436)	(b) (7)(F), (b) (3)

Source

The leak occurs in a section of aboveground pipe adjacent to Remote Gate Valve (RGV) 105 at (b) (7)(F), (b) (3) failure occurs as a guillotine cut on the pipe. Multiple valves fail to close for 120 minutes during a communications link failure . (b) (7)(F), of oil are released from the pipeline by the time the valves are manually closed, and the pipeline is empty in this section.

Environmental Conditions

Time	Not available	**Wind**	5 mph, from SW
Season	Winter	**Seas**	N/A
Snow/Ice Coverage	2 feet of snow	**Temperature**	10ºF
Visibility	Sky is overcast No precipitation	**Tide/Current**	Moose Creek – ice-covered Tazlina River – ice-covered

Environmental Considerations – Tazlina River, Segment 1

The immediately surrounding area consists of relatively flat terrain, covered with moss, grass, and low shrubs, and intermixed with black spruce, birch, and some stands of white spruce. The area is predominantly underlain by permafrost. Numerous frozen ponds and small lakes are in the area. Moose Creek drains this area and connects to the Tazlina River approximately 12 creek-miles away. Moose Creek and the Tazlina River are ice-covered.

Large mammals in the area are caribou and moose. There are 2 feet of snow on the ground. The site of the spill is in proximity to the community of Glennallen.

Assumptions

1. Aboveground pipeline is cut by sabotage.
2. Multiple valves fail to close for 120 minutes during a communications link failure.
3. The Operations Control Center (OCC) receives alarms related to pipeline flow loss, pressure loss, and valve control communications link loss.
4. (b) (7)(F), are released within 1 hour.

SCENARIO 14 – MAXIMUM DISCHARGE
(b) (7)(F), (b) (3)

Tactical Summary
Containment and Control Actions

Tactical Reference	Tactics	Equipment
Volume 3, Sections 4.1.1	Use dozers, front end loaders, and graders to construct a snow berm around the perimeter.	Volume 2, Table MAXD.2 and MAXD.3
Volume 3, Section 4.3.3	Recovery of spilled oil will be by use of multiple pumps, skimmers, portable oil containers, vacuum trucks, and road tankers. Recovered oil is transported to Valdez for injection into crude oil storage tanks. Over time, an oil reinjection point is set up at a nearby mainline valve, into a relief tank, or into the bypass line around BL1 or BL2 at Pump Station 11 (PS11).	Volume 2, Table MAXD.3

Support Action Taken

Notification made in accordance with Volume 1, Section 1 "Response Action Plan." (See Table MAXD.1, Maximum Discharge Scenario Timeline Matrix).

Actions

Actions are based on the above notifications; a number of simultaneous response actions begin.

1. OCC shuts down the pipeline.
2. OCC requests personnel from the Glennallen Response Base to proceed immediately to pipeline valve locations indicating communication system failure. On arrival, these people close the valve locally. OCC will continue to attempt to reestablish the communication link.
3. Reconnaissance crews from the Glennallen Response Base are dispatched to the area indicating pressure loss to confirm a pipeline leak has occurred. The helicopters from Fairbanks Response Base and Glennallen Response Base are dispatched. If weather conditions prevent either or both helicopters from flying, the reconnaissance proceeds with ground teams.
4. Response team mobilization begins with personnel call-out from Delta Response Base and the Glennallen Response Base Response Team. Second tier response mobilization call is made to the Fairbanks and Valdez Incident Management Teams as well as Valdez response personnel.
5. The regional OC assumes the position of Initial Incident Commander and the Glennallen RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Fairbanks Emergency Operations Center is set up. The RBS establishes communications with Delta Response Base, Glennallen Response Base, and Valdez-based response personnel.

SCENARIO 14 – MAXIMUM DISCHARGE
(b) (7)(F), (b) (3)

Oil Trajectory

The (b) (7)(F), of oil spilled from a guillotine cut and simultaneous multiple-valve failures at this location would flow to the southwest along, and generally away from, the pipeline right-of-way. The oil flow will progress over ground in a wide swath until reaching a small tributary of Moose Creek. Upon reaching Moose Creek, it will follow this channel on top of the ice. The general spread of oil will be slowed by the 2 feet of snow covering the ground.

Determination of the maximum spread of oil will need to be established by personnel on the ground using hand shovels to dig a trench in the snow at intervals, as the oil may run under the snow.

The spill volume, location, and failures which result in the spill are taken from the "Technica Inc., Trans Alaska Pipeline System Risk Assessment, Final Report," January 19, 1991. In Section 9.2.1 of that report, "Highlights of the Risk Curves," it is stated that, "Spills of (b) (7)(F), or greater are based on multiple failures of remote gate valves (RGV) and occur at worst locations. Less attention should be paid to these scenarios since they are highly unlikely (one in a million years) and not realistic."

As stated in the introduction to this scenario, the Response Plan described in this scenario is one combination of resources and one organization of those resources that can be used to meet the response objectives and strategies. The plan, as a scenario, depicts successful implementation of tactics to meet the response objectives and strategies. Given the spill conditions and resources mobilized to contain and recover the oil as described in this scenario, a successful response is expected.

In an actual response, there may be a number of unpredictable events and conditions that preclude complete success of each tactic. In recognition of the difficulty in making completely accurate predictions and the fast pace of changes in an incident, the incident management process incorporates an on-going evaluation of tactical success and alternative tactics. If the initial tactics are not completely successful, they will be augmented to accomplish the objectives, or alternative tactics will be implemented. Alternative tactics can call upon the equipment and tactics described in the *Trans Alaska Pipeline Oil Discharge Prevention and Contingency Plan Volume 3 "Tactics" and Volume 1 Section 3.6 "Response Equipment"*, or other tactics determined by Operations (Ops) to be effective during a response. Additionally, equipment and personnel from response action contractors, vendors, and other response organizations can be brought in to supplement local supplies.

After the initial mobilization and ramp up described in this scenario, eventual longer-term oil spill clean-up activities will take place and some of the initial tactics will continue. The duration of these longer-term activities depends largely on the extent of clean up required, which in turn depends primarily on how much land and other resources are affected and the characteristics of the oiling, including how heavy the oiling is in the impacted area. In extreme cases, cleanup may require more than one summer season. Bioremediation typically requires several seasons to work successfully. Waste management and disposal and decontamination must be continued as long as any cleanup activity is underway.

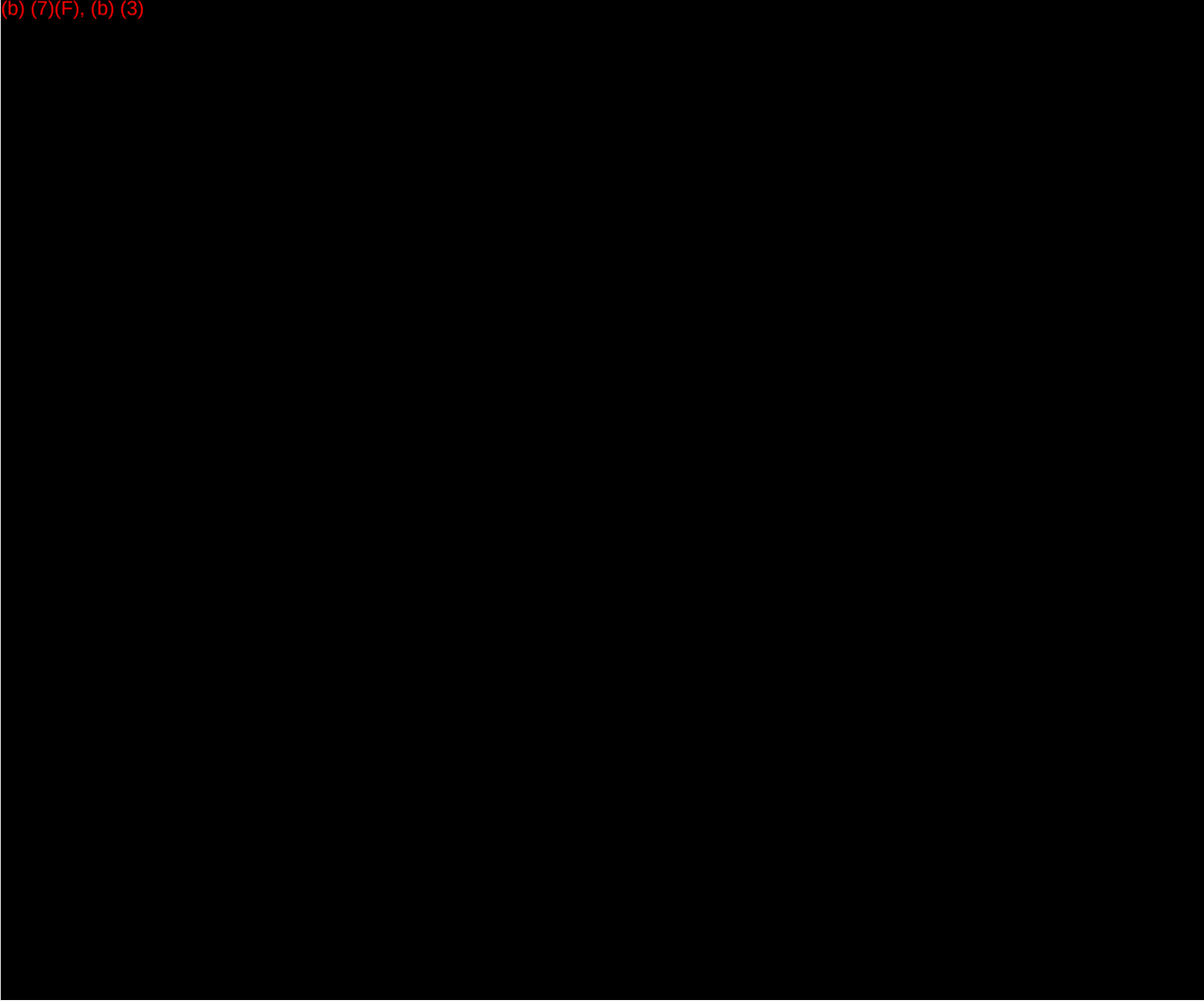


FIGURE MAXD.1
MAXIMUM DISCHARGE SCENARIO DEPLOYMENT MAP

TABLE MAXD.1 MAXIMUM DISCHARGE SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0600-0700)	Hour 1-3 Day 1 (0700-0900)	Hour 3-12 Day 1 (0900-1800)	Night Shift (Hour 12) + Day 1 (1800) +
Situation/Status • **Weather** • **Environmental**	Winter season. Winds SW at 5 mph. Temperature 10 ºF.	Oil on land is estimated at 120,000 barrels, flowing southwest along, and generally away from, the pipeline right-of-way (ROW).		
Objectives and Strategies[1]	**Objectives**	**Strategies**		
	Site security: safety, site control, surveillance	Control site access, evacuate non-essential personnel, review initial safety assessment, develop site safety plan, control waterway and airspace, and develop and implement leading edge tracking. Protect life safety. May require evacuation of homes and businesses.		
	Contain the oil and restrict its spread.	Use dozers, front end loaders, and graders to construct a snow berm around the perimeter.		
	Close any valves remaining open.	Closure of any valves remaining open can be accomplished by initiation of a "close" command at valve enclosure or by use of a power-assisted manual valve closure.		
	Recover the spilled oil.	Recovery of spilled oil will be by use of multiple pumps, skimmers, portable oil containers, vacuum trucks, and road tankers. Recovered oil is transported to Valdez for injection into crude storage tanks. Over time recovered oil may be injected at a nearby mainline valve, into a relief tank, or into the bypass line around BL1 or BL2 at Pump Station 11 (PS11).		
	Agency and stakeholder notification	OCC notifies the following State and Federal Agencies: Alaska Department of Environmental Conservation (ADEC), National Response Center (NRC), Bureau of Land Management (BLM), and Alaska Department of Natural Resources (ADNR). This notification is followed up with a hard copy. Stakeholders are notified and kept up-to-date on the response.		
Fire Prevention, Control, and Safety	Two firefighters from Valdez are mobilized by the Valdez helicopter to Glennallen Response Base, where they mobilize the Glennallen Response Base fire foam skid to the site. ETA is T+ 2 hours. An additional 2-person fire fighting crew mobilizes a Valdez fire truck to the site. ETA is T + 4 hours. Safety specialists are mobilized from Glennallen Response Base, Valdez, and Fairbanks Response Base. The first responder to the spill site brings air monitoring equipment and completes an initial site safety assessment. The purpose of the assessment is to determine safe working locations, communicate knowledge about existing hazards to response personnel, and establish safe avenues of approach to the spill site. The information is radioed to the Incident Commander and is used to verify that all responders have appropriate personal protective equipment (PPE) before entering the spill site.	The Glennallen Response Base safety specialist arrives on-site at T + 2 hours and conducts a site safety analysis using the "Site Safety and Control Analysis" (Form ICS 201-5) to provide identification of potential hazards, PPE requirements, and establishment of decontamination. In addition, safety objectives for other areas of the response, such as air operations and ground transportation, are also addressed. Fire: All necessary precautions are taken to ensure the risk of fire is minimized. The lower explosive limit (LEL) is monitored on a regular basis at all recovery sites. Work activities are controlled depending upon the LEL. If LEL is >20 percent, additional fire and safety precautions are initiated to eliminate ignition sources. These include, but are not limited to, use of nonsparking or intrinsically safe equipment and elimination of open flames. Incipient level fire suppression equipment is provided on site. This may include a fire truck, fire foam skid, wheeled 150-lb extinguishers, and handheld extinguishers. All firefighting by on-site personnel is limited to incipient fire suppression. Defensive firefighting operations will be conducted from outside the hot zone to control advanced exterior fires utilizing high volume handlines. The primary mission of firefighters is personnel safety and protection. A 2-person Mutual Aid firefighting crew mobilizes from the North Slope by aircraft to Delta where they mobilize with the Fairbanks Response Base fire foam skid that was mobilized from the Fairbanks Response Base to the site. ETA is T + 24 hours. Glennallen Response Base fire foam skid arrives on-site at T+ 2 hours.	Given the magnitude of the spill, the Alaska State Troopers are requested to provide assistance to Alyeska Security personnel by restricting access to the spill scene. They are also requested to assist in notification and possible evacuation of any businesses or homes close enough to the spill site. The Valdez fire truck arrives on-site at T + 4 hours. The Valdez and Fairbanks Response Base safety specialists arrive on-site at T + 3-6 hours. The Mobile Command Post with the "Go Team" arrives to provide support services.	The Fairbanks Response Base fire foam skid arrives on-site at T + 24 hours.
Protection of Environmentally Sensitive Areas (ESAs)				

TABLE MAXD.1 (CONTINUED) MAXIMUM DISCHARGE SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0600-0700)	Hour 1-3 Day 1 (0700-0900)	Hour 3-12 Day 1 (0900-1800)	Night Shift (Hour 12) + Day 1 (1800) +
Response Actions	Upon arrival at the spill scene, an assessment of the spill scene is made by the first person arriving. The person assessing the site provides information to the Incident Commander related to a) apparent cause of the spill, b) size of the spill, c) location of the spill, d) description of the contaminated area and proximity to sensitive areas, and other information listed on the "Oil Spill Wallet Card." The next action is to complete the tasks and situation assessments necessary to do an initial site safety assessment as described above. The regional OC assumes the position of Initial Incident Commander and the Glennallen Response Base RBS assumes the position of Operations Section Chief. As soon as is practicable, the OC transfers the Incident Commander position to a member of the Fairbanks IMT and transitions to the position of Deputy Operations Section Chief. The Command Post is set up in Fairbanks. The Glennallen Response Base RBS establishes communications with Delta, Glennallen Response Base, and Valdez-based response personnel. The spill scene assessment and discovery of the magnitude of the spill and its apparent cause result in additional emergency actions taking place. Upon discovery of the cause of the spill as being probable sabotage, a line-wide reconnaissance of the pipeline is ordered along with notification to the Alaska State Troopers and the Federal Bureau of Investigation.	Upon realization of the magnitude of the spill, the Incident Commander expands the response resources mobilization notification to all pump stations, Alaska Clean Seas (ACS), and mutual aid partners such as the North Slope Operators and the Alaska Department of Transportation. The safety of personnel and the public are addressed. Response personnel are advised not to enter the immediate pipeline damage area and to be aware of anything outside of normal conditions at valve locations and along aboveground piping sections.		
Response Actions **Task Force 1** **Discharge Tracking**	Reconnaissance crews are mobilized to the area indicating pressure loss to confirm a pipeline leak has occurred. The helicopters from Glennallen /PS11 Response Base, Fairbanks Response Base, and Valdez are mobilized. If weather conditions prevent either or both helicopters from flying, the reconnaissance would proceed with ground teams.	The tracking of spilled oil is intended to provide both tactical and strategic information to the responders. Tracking is done by air, on the ground, or both. Aerial tracking is done visually by helicopter. On the ground, tracking is done by containment and recovery operations personnel who establish the extent of spread of the spilled oil. In the initial response, tracking reports are made to the incident command center via radio at least on an hourly basis. As the containment and recovery operations are established and the risk of spread is reduced, reports are provided less frequently.	Determination of the maximum spread of oil is established by personnel on the ground. Hand shovels are used to dig a trench in the snow at intervals, as the oil may run under the snow	Four additional responders from baseline contractor and Ahtna join TF-1 for the night shift.
Response Actions **Task Force 2** **Containment and Recovery**	Responders with heavy equipment (see Table MAXD.3) are mobilized from the nearest response bases.	Dozers and front end loaders are used to construct a snow berm around the perimeter. TF-2 initiates recovery operations with pumps and portable storage.	Additional heavy equipment and recovery equipment arrives.	Improvements to initial containment accomplished.

TABLE MAXD.1 (CONTINUED) MAXIMUM DISCHARGE SCENARIO TIMELINE MATRIX

Regulatory/Response Area	Initial Actions – Hour 0-1 Day 1 (0600-0700)	Hour 1-3 Day 1 (0700-0900)	Hour 3-12 Day 1 (0900-1800)	Night Shift (Hour 12) + Day 1 (1800) +
Response Actions **Task Force 3** **Recovery and Hauling of Recovered Oil**		Recovery crews are mobilized from APSC and Response Action Contractors (baseline contractor and Ahtna). APSC and contracted recovery equipment (see Table MAXD.3) is mobilized.		Spilled oil is recovered by using multiple pumps, skimmers, portable oil containers, vac trucks, and road tankers. Oil pockets on ground are recovered by using pumps, vacuum systems, and sorbents. Contaminated snow dumps are constructed of dirt berms covered with pit liner material to receive snow. Circulation heaters would be installed to melt the snow. Embedded oil is recovered from ground cover by warm water flotation (temperature dependent), mechanical shredding, raking, and incineration of organic materials. In areas where this type of tactic would be too intrusive and damaging to the vegetative mat, an alternative is to secure the area with berms. As temperatures become warmer, these areas are flooded with water and the oil is skimmed off the surface. Recovered oil is transported to Valdez for injection into crude storage tanks. Oily water would be trucked to the Valdez Marine Terminal for shipment by tanker of opportunity to a Lower 48 treatment facility. Temporary oily water storage may be provided in the 90's tanks if necessary. Over time, an oil reinjection point could be injected at a nearby mainline valve, into a relief tank, or into the bypass line around BL1 or BL2 at Pump Station 11.
Protection/ Rehabilitation **Task Force 4** **Wildlife Hazing**	The Wildlife Protection and Rehabilitation Plan is activated (also see Protection of ESAs above). Environment Unit contacts CCI to provide 10 wildlife hazers from Fairbanks and requests them to mobilize the Fairbanks wildlife treatment center. CCI wildlife hazers begin mobilizing from Fairbanks to the spill site.		All wildlife actions are coordinated by the Environmental Unit with the Incident Unified Command and the State and Federal wildlife management agencies. CCI hazers arrive on-site at T + 12 hours with the wildlife treatment center. • The area of the spill site(s) is surveyed for the presence of large and small mammals. • Animal hazing operations are implemented to move animals out of the spill areas to prevent contact with oil. • Oiled animals (small mammals, grouse, ptarmigan) are captured if possible and rehabilitated. Larger mammals (moose and caribou) are not likely to be captured. If lightly oiled, they are monitored; if heavily oiled and demonstrating ill effects, euthanasia is to be considered. IBRRC (Berkeley, CA) are notified and requested to establish wildlife hazing, treatment, and stabilization facilities. Treatment center in Anchorage is put on standby. The IBRRC arrives on location within 24 hours and takes over coordination of overall wildlife response operation.	
Logistics				Logistics: Field work crews are housed in Glennallen area at local commercial accommodations. A portable 100-person camp is also set up within four days to supplement local accommodations.
Pipeline Repair Team			Contractor and APSC personnel are mobilized with equipment to repair the failed section of pipe.	

[1] Equipment, personnel, and tactics described above are an illustration of one way to clean up a spill of this size in the shortest time possible. An actual response would be incident-specific, dependent upon such factors as personnel safety and environmental conditions. Other combinations and organizations of resources could be used to meet the same scenario objectives. This scenario is for illustration purposes only and is not a performance standard or guarantee of performance.

TABLE MAXD.2 MAXIMUM DISCHARGE SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1								Hour 1-3							Hour 3-48+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Security	Site Control	Security	2	2	--	--	--	--	--	--	2	--	--	--	--	--	--	2	--		--	--	--	--
Discharge Tracking	Aerial Tracking[4]	DT	--	--	--	1 helicopter (1)	--	--	--	--	--	--	3 helicopters (3)	--	--	--	--	--	--	4 helicopters (4) 1 aircraft (1)	--	--	--	--
	Ground Tracking[5]	DT	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		--	--	--	
Fire Protection	Fire Protection	FP	--	--	--	--	--	--	--	--	--	--	Glennallen Response Base fire foam skid (2)	--	--	--	--	--	--	2 fire foam skids (4) 1 fire trucks (2)	--	--	--	--
Safety	Site Safety and Control[6]	--	--	--	--	--	--	--	--	--	1	--	--	--	--	--	--	4	--	--	--	--	--	--
Response	Discharge Tracking	TF-1	2	2	--	--	--	--	--	--	2	--	--	--	--	--	--	2		--	--	--	--	--
	Construct Snow Berms & Recovery	TF-2	--	--	--	--	--	--	--	--	20	1 dozers (1)[8] 1 loaders (1)[8]	1 vac trucks (1)[8] Portable containment tanks 3 @ 4-in pumps Hose	--	--	Various	(b) (7) (F), (b) (3)	285	9 dozers (9)[8] 6 loaders (6)[8] 3 graders (3)[8] 3 wash vans (3)[8] 3 buses (3)[8] 17 track vehicles (17)	12 ea. 10,000-gallon tank trucks (12) 11 vac trucks (11)[8] Portable containment tanks 11,500 ft of hose 67 ea. 2-in and 4-in pumps 6 rope mop skimmers, 4 elastic skimmers, 2 GT5O Lamor, 1 GT2O Lamor, 1 GT3O pump	--	--		
	Recovery and Hauling of Recover Oil	TF-3	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	16 snow machines 2 snowmelters	--	--	--	(b) (7) (F), (b)	(b) (7) (F), (b) (3)
Wildlife Response	Wildlife Hazing	TF-4	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10 CCI 10 IBRRC	Wildlife treatment center	--	--	--	--
	Repair	Pipeline Repair Team	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10	--	--	--	--	--	--

TABLE MAXD.2 (CONTINUED) MAXIMUM DISCHARGE SCENARIO ON-SITE RESOURCE TALLY

Resource Description	Tactics	Task Force	Hour 0-1								Hour 1-3							Hour 3-48+						
			People for Setup[1, 2]	People for Ops[1, 2]	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]		People for Ops	Heavy Equipment (Operators)	Response Equipment (Operators)	Skimmers[3]		Storage[3]	
							No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)				No.	Capacity (bbl/hr)	No.	Capacity (bbl)
Personnel Total			Note[7]	4	--	1					25	--	6					303	61	34				
Mechanical Equipment Total					--	1						2	8						59	165				

[1] Number of people excludes state or federal representatives in the organization. Not all individuals would be on incident full time.

[2] Operation of a tactic may require fewer people than set up.

[3] Skimmer numbers and rates and storage number and volumes are all for only one set of tactics that could be used for this scenario.

[4] Helicopter supports containment and recovery operations in addition to providing hourly discharge tracking reports.

[5] On-land containment and recover task force personnel conduct ground tracking; therefore, totals are not tallied here.

[6] Initial responders are safety-trained and can respond to assess site for safety hazards prior to the arrival of safety specialists.

[7] Column should not be added to obtain a total. Personnel completing a set up of one tactic are reassigned to another task.

[8] This equipment operator is also a responder and is included in the number shown in the "People for Ops" column.

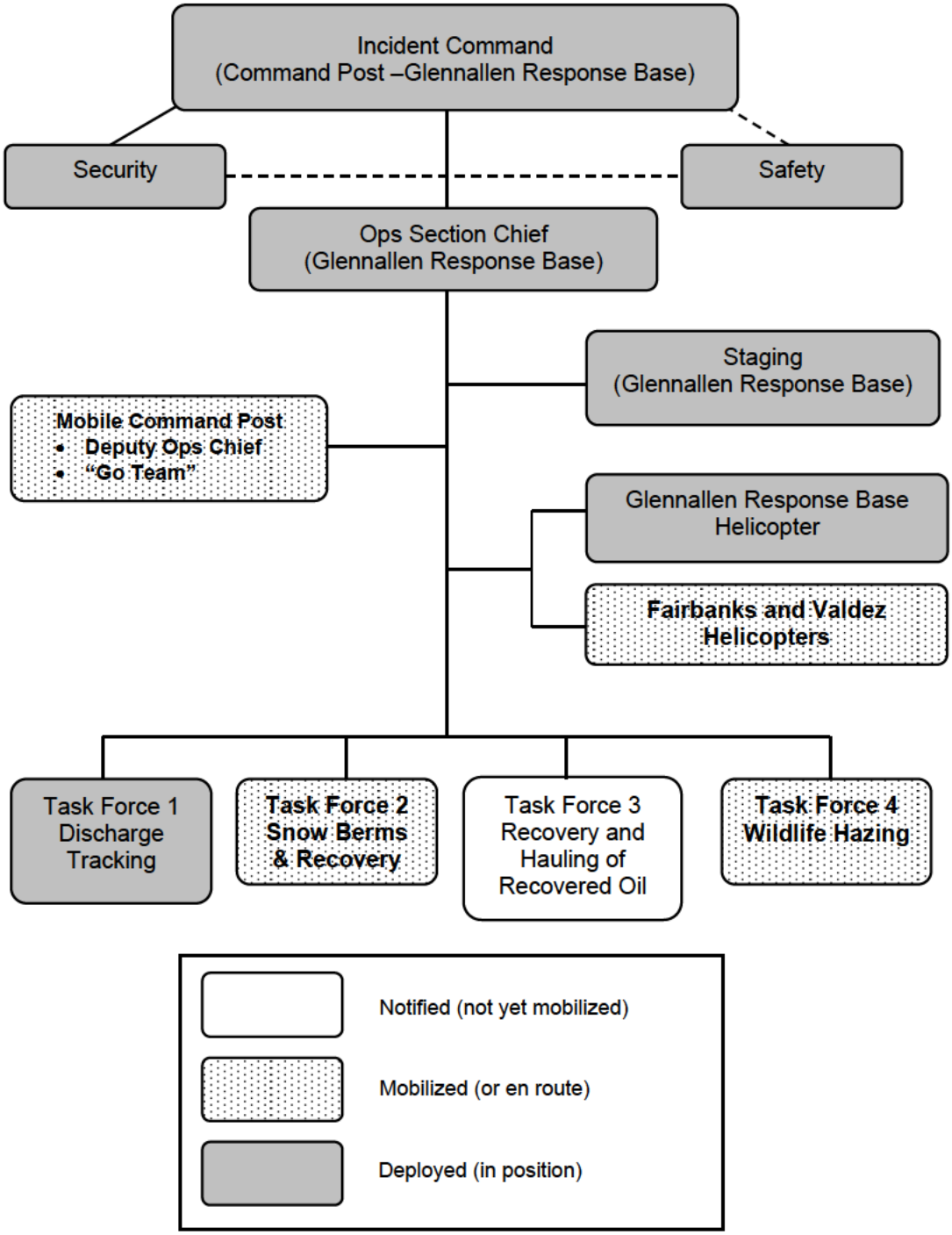


FIGURE MAXD.2
MAXIMUM DISCHARGE SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 0-1

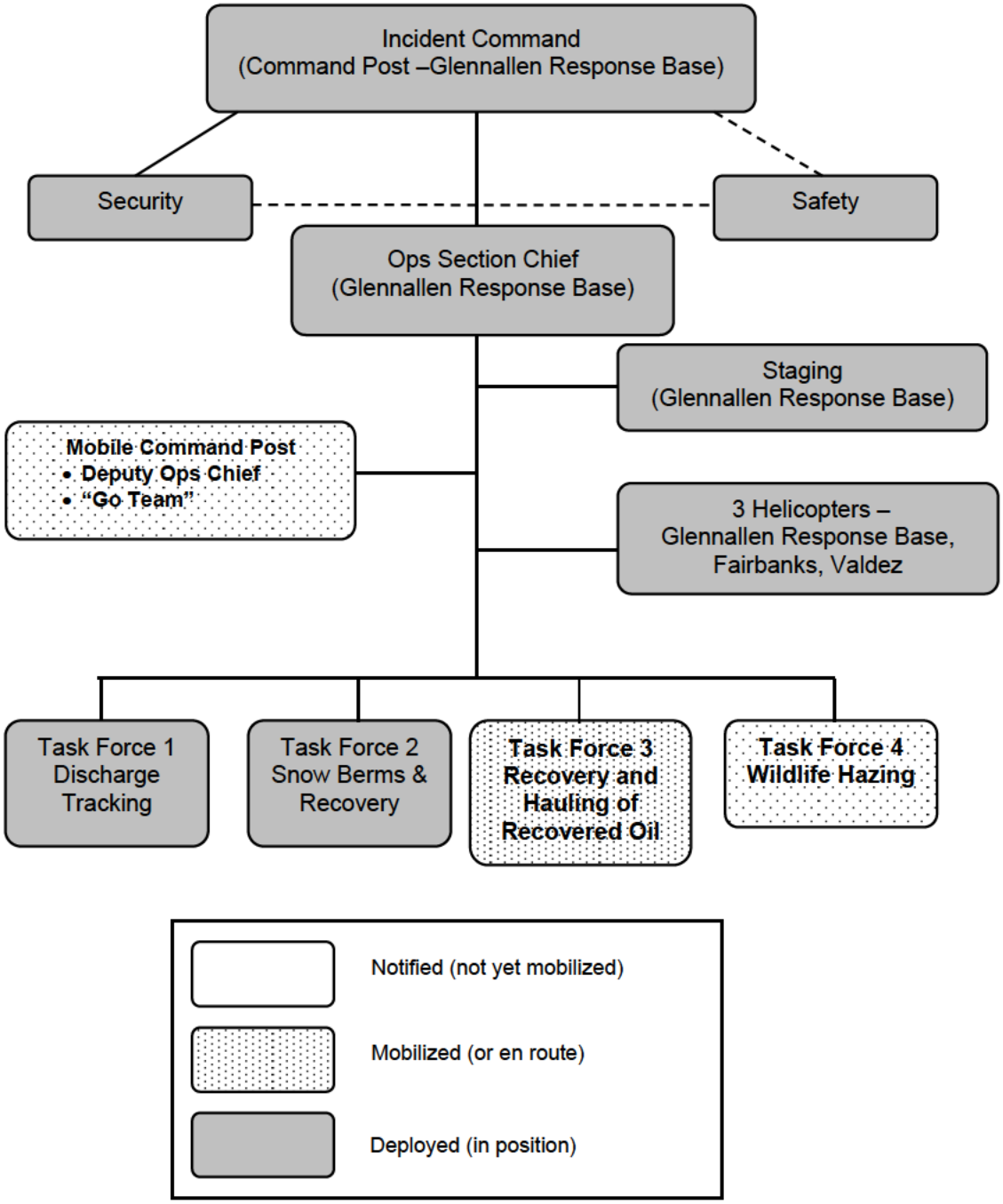


FIGURE MAXD.3
MAXIMUM DISCHARGE SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 1-3

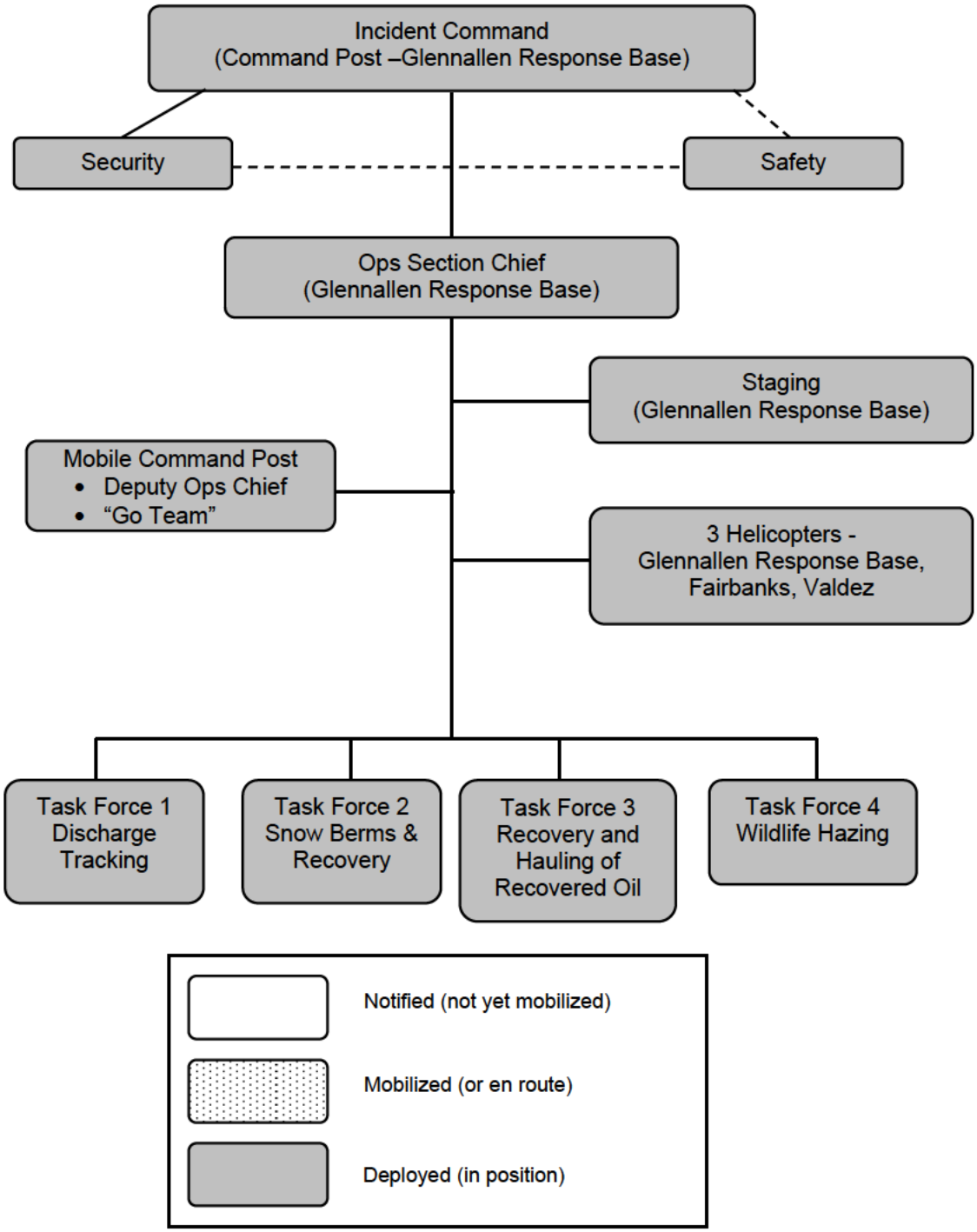


FIGURE MAXD.4
MAXIMUM DISCHARGE SCENARIO RESPONSE ORGANIZATION CHART
OPERATIONS SECTION AND FIELD RESOURCES, HOUR 3-48+

TABLE MAXD.3 MAXIMUM DISCHARGE SCENARIO
RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY OF OIL

Equipment/Personnel (Quantity)	Source	Purpose
B206 Helicopters (2)	Glennallen/PS11 Response Base, Fairbanks	Reconnaissance
Helicopter	Fairbanks Response Base	Reconnaissance
Helicopter	Valdez	Recon or transport
DeHavilland DASH 8 Aircraft	Anchorage	Transport
966/930 Loaders (6)	Southern Region	Loading end dump
D-8/D-9 Dozer (4)	Central and Southern Regions	Heavy equipment
D-3 Dozer (5)	Central and Southern Regions	Heavy equipment
Tucker/Bombardier Track Vehicles (17)	Central and Southern Regions	Transport
Transport bus (3), personnel	Southern Region, Valdez	Labor
Mobile Command Post	Fairbanks Response Base	Support
Snow Machines (16)	Central and Southern Regions	Heavy equipment
Field Workers (35)	APSC	Labor
Incident Mgmt team (80)	APSC	Coordination and Labor
Field Workers (150)	Baseline contractor	Labor
Field Workers (20)	Ahtna Construction	Labor
4,200 gal. Vacuum Trucks (11)	Linewide	Recovery and hauling of recovered oil
2 Lister snowmelters	Fairbanks Response Base and ACS	Melt snow above oil spill
2-inch and 4-inch Pumps (67)	Linewide	Collect oil off of ground
6 rope mop skimmers		Recovery
4 elastic skimmers		Recovery
2 GT50 Lamor pumps		Recovery
1 GT20 Lamor pumps		Recovery
1 GT30 Lamor pump		Recovery
Portable containment (963,000)	Linewide	Contain oil

TABLE MAXD.3 (CONTINUED) MAXIMUM DISCHARGE SCENARIO RESOURCE MOBILIZATION FOR CONTAINMENT AND RECOVERY OF OIL

Equipment/Personnel (Quantity)	Source	Purpose
2-inch to 4-inch Hose (11,500 feet)	Linewide	Transport collected oil to containers
Light Towers (22)	Linewide	Light for winter operations
Decontamination wash vans (3)	PS01, Valdez	Decontamination
Graders (3)	ADOT	Heavy equipment
Tanker Trucks, 10,000-12,000 gallons each (12)	Transportation Contractors	Transport Recovered Oil
Fire Truck (1)	Valdez	Fire Suppression
Fire Fighters (4)	Valdez	Fire Suppression
Fire Fighters (2)	Mutual Aid	Fire Suppression
Fire Foam Skids (2)	Fairbanks Response Base Glennallen Response Base	Fire Suppression

TABLE MAXD.4 MAXIMUM DISCHARGE SCENARIO
SUMMARY OF OIL FATE AND ESTIMATED RECOVERY

Estimated volume of oil and emulsified oil retained and recovered at multiple locations is summarized in Table MAXD.4. The overland oil flow is expected to create a fan-shaped plume approximately 1 mile long and ½ mile wide until it reaches the tributary of Moose Creek. The oil will travel along the top of the ice (on the tributary of Moose Creek) with an average oil thickness of 1 inch, until it reaches Moose Creek 2 miles downstream. Emulsification rates are expected to be approximately 20 percent as snow is incorporated into the oil.

The methods used during the first 72 hours will consist primarily of pumps and vacuum trucks. For this scenario, it is assumed that each vacuum truck has the capability of collecting and transferring 1,000 bpd to awaiting tanker trucks. This was used to determine the recovery rate, assuming a total of eleven vacuum trucks are operating at the site. Excavation and cleanup of contaminated snow is expected to start after T +72 hours and therefore no recovery from these areas is reflected in the table.

Location	Oil Contained (bbl)	Emulsification (%) / Total (bbl)	Cumulative Oil Recovered (thousands of barrels)								
			4 hr	12 hr	24 hr	36 hr	48 hr	60 hr	72 hr	Total	Remaining
(b) (7)(F), (b) (3)	[redacted]										

TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN



Volume 3
Tactics

CP-35-1

Alyeska pipeline SERVICE COMPANY

TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

Volume 3
Tactics

CP-35-1

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Revision History

Approved by: **John Baldridge,** *Senior Director Pipeline Operations*

Document Title	Document Number	
Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan *Tactics Volume*	*CP-35-1 Volume 3*	
Current Revision Features	**Ed. 2, Rev. 6**	**August 28, 2014**
Approval to publish Government Letter 31069 **Government Letter 30375: Minor Miscellaneous Edits** Changes include correcting containment site locations, correcting citations and response contractor for helicopter services.		
Revision Features	**Ed. 2, Rev. 5**	**January 30, 2014**
Approval to publish Government Letter 29629 **Government Letter 29440: Containment Sites inventories updates resulting from inspections per 11/30/11 condition of approval.** Locations for various containment sites have been updated for clarity and consistency. Specific location information has been added to Table 5-1, and associated maps have been updated. Containment site maps have been updated to more accurately reflect conex locations, latitude, and longitude, and other minor updates have been made.		
Revision Features	**Ed. 2, Rev. 4**	**March 20, 2013**
Approval to publish Government Letter 27676 **Government Letter 27045: 2012 Containment Site Amendment** Section 5: Updates to Table 5-1 and Containment Site Diagrams and Site Instructions		
Revision Features	**Ed. 2, Rev. 3**	**August 17, 2012**
Approval to publish Routine Amendment, Government Letter 26203 **Government Letter 25986: Revisions to Reconnaissance Team Action Information** Reconnaissance team action information has been updated in Section 2 for Recon Sections 9 and 10 (PS09 to PS10 and PS10 to PS11, respectively).		
Revision Features	**Ed. 2, Rev. 2**	**May 11, 2012**
Approval to publish Routine Amendment, Government Letter 25562 **Government Letter 25247: Revisions to Containment Site Information** Location information has been updated for containment site CS 10-17.		
Revision Features	**Ed. 2, Rev. 1**	**March 8, 2012**
Approval to publish Routine Amendment, Government Letter 25240 **Government Letter 25019: Revisions to Containment Site Information** Location information has been updated for containment sites 4-30, 5-8, 5-22, 6-6, 6-13, 6-38, 7-12, 8-12, 8-16, 10-17, and Area of Opportunity Site A.		
Revision Features	**Ed. 2, Rev. 0**	**December 21, 2011**
Approval to publish Government Letter 24796. Initial issue of Volume 3, Edition 2, Revision 0.		
Revision Features	**Ed. 1, Rev. 5**	**April 14, 2011**
Approval to publish Government Letter 23037. Section 5 and Table 5.1: Updates to Containment Site and Areas of Opportunity Deployment Diagrams and Site Instructions (GL 22498)		
Revision Features	**Ed. 1, Rev. 4**	**November 4, 2009**
Approval to publish Government Letter 19750. Section 2.1: Updated information for CS 3-1 and 3-2. (GL 19461)		
Revision Features	**Ed. 1, Rev. 3**	**October 23, 2008**
Approval to publish Government Letter 17106. Section 2.1: Updated information for CS 2-7. (GL 13473)		
Revision Features	**Ed. 1, Rev. 2**	**April 22, 2008**
Approval to publish Government Letter 15680. Section 2.5: Updated Recon Actions for Sections 2 and 3 for PS03 Post SR Amendment (GL 15680)		

Revision Features	Ed. 1, Rev. 1	September 7, 2007
Approval to publish Government Letter 13130, 13170, and 13268. Section 2.1: Updated information for teams 5-1, 5-2, 7-1 and 7-2. (GL 13170) Section 5.2: Added new section for areas of opportunity. (GL 13130) Containment Sites Section: Added Gulkana Areas of Opportunity. (GL13130) Section 6: Added Michael Baker Jr. reference. (GL 13268)		
Revision Features	**Ed. 1, Rev. 0**	**January 30, 2007**
Approval to publish Government Letter 10683. Initial issue of this manual. This manual replaces *CP-35-1 GP, CP-35-1 Region 1, CP-35-1 Region 2, CP-35-1 Region 3, CP-35-1 Region 4,* and *CP-35-1 Region 5*.		

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Sagavanirktok River 3 Contingency Area .....
Toolik/Kuparuk Rivers Contingency Area .....
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Atigun River Contingency Area .....
North Fork Chandalar River River Contingency Area .....
Dietrich River Contingency Area .....
Middle Fork Koyukuk River Contingency Area .....
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Jim River Contingency Area .....

PLMP

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Kanuti River Contingency Area .....
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Goldstream Creek Contingency Area .....
Chena River Contingency Area .....
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Little Salcha River Contingency Area .....
Salcha River Contingency Area .....
Shaw Creek Contingency Area .....
Big Delta/Delta Junction Contingency Area .....
Jarvis Creek Contingency Area .....
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List of Abbreviations

ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
ADNR	Alaska Department of Natural Resources
AMS	Access road material site
API	American Petroleum Institute
APL	Access road pipeline
AR	Access road
ATV	All-terrain vehicle
BTU	British thermal unit
cfs	Cubic feet per second
CMP	Corrugated metal pipe
CKV	Check valve
Crk	Creek
CS	Containment site
DHMP	Dalton Highway milepost
DOT	Department of Transportation
DRA	Drag reducing agent
DS	Disposal site
RF	East fork
EHMP	Elliott Highway milepost
EPA	Environmental Protection Agency
ft	Feet
FOSC	Federal On-Scene Coordinator
fps	Feet per second
GWT	Groundwater table
Hwy	Highway
ICS	Incident Command System
IRT	Initial Response Team
Lk	Lake
LVB	Line volume balance
LWC	Low water crossing
P&CM	Pipeline Civil and Maintenance Coordinator
M.F.	Middle fork
MP	Milepost
MS	Material site or Maintenance Supervisor
NF	North fork
NPDES	National Pollutant Discharge Elimination System
OCC	Operations Control Center
Oks	Oksrukuyik
OMS	Operations material site
OSCP	Oil spill contingency plan
PCB	Polychlorinated biphenyl
PFD	Personal flotation device
PL	Pipeline
PLMP	Pipeline milepost
POTW	Publicly owned treatment works
PPE	Personal protective equipment
PS	Pump station
PSY	Pipe storage yard
PVC	Polyvinyl chloride
R	River
RCRA	Resource Conservation and Recovery Act
Rd	Road
Recon	Reconnaissance
RGV	Remote gate valve
RH	Richardson Highway
RHMP	Richardson Highway milepost
Sag	Sagavanirktok
SF	South fork
SOSC	State On-Scene Coordinator
STP	Sewage treatment plant
TAPS	Trans Alaska Pipeline System
TAqH	Total aqueous hydrocarbons
TPH	Total petroleum hydrocarbons
TSD	Transportation, storage, or disposal
TVB	Transient volume balance
WF	West fork
ZRA	Zone of restricted activity

Section 1. Introduction

1.1 IMPORTANT NOTE

The information presented in this plan provides typical alert, reconnaissance, and control actions for a number of different spill circumstances, weather conditions, etc. It is impractical to make specific plans for every conceivable situation; therefore, it must be recognized that flexibility is an integral part of these procedures and that judgments will have to be made by trained field personnel. The Initial Response Teams will include skilled personnel so that each can independently mobilize and activate contingency gear and emergency response equipment.

1.2 STRUCTURE OF VOLUME 3

This document is Volume 3 of the four-volume *Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan* (C-Plan). Volume 3 contains tactical information to guide the reconnaissance, containment, and cleanup of a spill anywhere along the Trans Alaska Pipeline System (TAPS).

For purposes of reconnaissance, the 800 miles of the pipeline are subdivided into *sections* between the pump stations (PSs). For initial response and containment actions, the pipeline is divided into *contingency areas*, each of which generally covers a distinct drainage pattern. The contingency areas are further subdivided into *segments* for purposes of containment actions, access, and environmental information. Specific containment instructions and information on access and environmental sensitivities are provided for each segment.

Following this introduction, the remaining sections of Volume 3 cover the following topics:

- Reconnaissance Actions
- Containment Actions
- Response Tactics
- Containment Site Deployment Diagrams
- Hydrology of Major Drainages

Upon notification of a spill, field response personnel near the site will respond without delay, and a reconnaissance team will be dispatched following the instructions contained in Section 2 of this volume. If a reconnaissance team locates the spill, this team becomes part of the Initial Response Team (IRT). The initial response will be supplemented as soon as practical by further effort under the direction of the Operations Section Chief, who will direct the response and be fully responsible to the Incident Commander for containment, recovery, cleanup, and restoration. The Incident Commander also interfaces with on-site federal and/or state representatives and coordinates input from local non-Alyeska personnel. If a Federal or State On-Scene Coordinator is assigned to the spill, the Incident Commander will serve as their primary contact. The Incident Commander will arrange for assistance as needed from within and outside the company.

Initial response actions are control actions aimed at implementing containment measures in contingency areas and segments. The initial response actions described in this plan are those which can be predicted in advance. The extent and specific direction of response depend on the nature of the spill and the judgment and training of the response personnel. Alyeska and contractor personnel assigned oil spill response duties must have a thorough knowledge of the objectives of this C-Plan, which is to be used as a guideline. Volume 1 of this C-Plan describes the Contingency Response Organization, which is based on the Incident Command System (ICS). The Operations Section Chief will direct the appropriate response activity.

The containment instructions for each contingency area segment show primary containment sites and containment zones that are designed to minimize damage to sensitive areas. Depending on the magnitude of the spill and environmental conditions, on-scene initial response personnel may have to devise additional containment measures and locations. For example, where feasible, an additional containment site to recover as much oil as possible will be established farther downstream at the leading edge of the spill. Criteria for site selection and guidelines for design of containment structures are contained in Section 5. Information on stream hydrology pertinent to containment can be found in Section 6.

Responders can use the maps and aerial photos in Volume 4 to determine the location of the spill, and can use the containment instructions in Section 3 of Volume 3 to identify specific access, impact, and other information to aid in determining containment efforts.

When a spill is contained, responders can refer to the Section 4 of this volume for recovery, cleanup, and disposal tactics.

1.3 OIL SPILL ASSESSMENT

Assessment of an oil spill involves gathering information about the spill characteristics including:

- **Spill Location (PLMP):** A milepost marker is located every 1 mile in the belowground sections and every two miles in the aboveground sections. The as-built stations are located on the vertical support members (VSMs) in the aboveground sections and indicate the footage from PS01. Another method of location is the use of landmarks — for example, “the south bank of the Chena River” or “500 feet north of Check Valve 75.”
- **Spill Volume:** How much has been spilled? What has been spilled (crude oil, diesel, hydraulic fluid, unknown, etc.)? To determine volume, it is helpful to estimate if the spill would fill a 5-gallon bucket, 55-gallon drum, or a vacuum truck or tanker truck.
- **Cause of Spill:** For example, fuel tanker accident, sabotage, corrosion, unknown, etc.
- **Area Covered by Spill:** How much area is covered? 10' × 40'? About the size of a football field?
- **Rate of Release:** A drip every 5 seconds? A fine spray? A hole in the pipe? A pipeline rupture?
- **Direction of Oil Movement:** For example, oil is moving south along workpad, or oil is moving towards a small drainage east of the pipeline.
- **Description of Contaminated Area:** For example, tundra, floodplain, wooded area or small drainage with water.
- **Proximity of Spill to Environmentally Sensitive Areas:** Streams known to contain fish, waterfowl, etc. (for example, the Chatanika River). These areas are listed under each contingency area.
- **Location of Trails, Roads, Rivers, Streams, and Communities near the Spill:** This will assist in determining access and containment sites.

- **Equipment, Vehicle or Tanks Involved:** For example, a turbine fuel truck accident, fuel storage tank leaking, heavy equipment accident, etc.
- **Weather Conditions:** For example, wind blowing from the north, light rain, fog and poor visibility for flying, sunny, etc.
- **Response Equipment Required:** For example, need a vacuum truck, or dozer to make berm, or booms, etc.
- **Organic Sheen vs. Oil Sheen:** An organic sheen, which is not harmful, will break up into blocky patterns when the water surface is disturbed. An oil sheen will separate and then close back together after the water surface is disturbed. A good way to check a sheen is to drop a small rock or pebble into the water and watch the sheen react.

Oil spills occurring from other activities along the pipeline right-of-way or off-site locations will require site-specific assessment and notification to allow proper response actions by the Operations Section Chief.

NOTE: *A plastic card (Form 9143) summarizing the above assessment information is issued to all employees during badging.*

Section 2. Reconnaissance Actions

2.1 IMPORTANT NOTE

The reconnaissance actions described here are initiated in response to a suspected leak. Emphasis is placed on visually locating the suspected leak. The following reconnaissance actions are separate from, and in addition to, routine surveillance and monitoring described in Volume 1 of this C-Plan.

Typical reconnaissance actions are between pump stations and are referred to as *section reconnaissance* (e.g., Section 5 is between PS05 and PS06). Table 2-1 lists the 12 reconnaissance sections for TAPS. When notification of a suspected leak within a section is received from the Operations Control Center (OCC), the Maintenance Supervisor (MS), Pipeline Civil and Maintenance Coordinator (P&CM), Response Base Supervisor (RBS), or designee will dispatch teams of reconnaissance personnel. The preferred reconnaissance method is by air, but if existing weather conditions prevent aerial reconnaissance, ground reconnaissance will be conducted. Aircraft will be deployed for maximum pipeline coverage in the shortest time for that specific section. It will be of particular importance to survey downstream drainages in areas of below ground pipe.

Summer and winter reconnaissance team assignments are appropriate for Line Volume Balance (LVB) alarm conditions or for other non-specific spill reports requiring a complete areawide search for potential spill sites. In the event of a public report or a transient volume balance (TVB) condition, there will usually be specific spill location information. After the TVB alarm is received, one to two reconnaissance teams will proceed directly to the detected leak area (defined as a 20-mile segment centered on the reported leak location). The team(s) will complete reconnaissance of the entire affected area determined by the TVB alarm in the most efficient manner.

TABLE 2-1 TAPS RECONNAISSANCE SECTIONS

RECON SECTION	NORTH PLMP	SOUTH PLMP
1	(b) (7)(F), (b) (3)	
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		

In the event that this reconnaissance, and/or any supplemental airborne reconnaissance, fails to locate a spill, initiate a ground reconnaissance according to the summer or winter protocols until the spill is either located or the alarm is determined to be false.

2.2 PIPELINE CONTROLLER ACTIONS

The Pipeline Controller on duty at the OCC is accountable for the safe, efficient and reliable use of the pipeline, tankage and pumping equipment. This person is also responsible for monitoring the pipeline, for spill notification, and for isolating sections or shutting down the pipeline.

- **Suspected Leaks**
  - Initiate reconnaissance by contacting appropriate pump stations.
  - Notify Lead Controller and Duty Officer.
- **Reported Leaks**
  - Log details of the report.
  - Notify Lead Controller and Duty Officer.
  - Notify MS, RBS, or P&CM responsible for area to dispatch personnel to the site, if not already there.
  - Check and log status of data being scanned at the points adjacent to the site of the suspected leak (live pressure, leading edge flow meter readings).
- **Obvious Leak**
  - Shut down all pump stations upstream of the probable spill area.
  - Initiate a CLOSE RGVs command to station upstream of suspected spill area.
  - Evaluate need to shut down remainder of the pump stations downstream of the spill site after the RGVs are closed.
  - Notify Lead Controller and Duty Officer.

2.3 MS, RSB, OR P&CM RECONNAISSANCE ACTIONS

- Dispatch Reconnaissance (Recon) Teams.
- Maintain radio contact with Reconnaissance Teams.
- Report Reconnaissance Teams' progress.
- Maintain a detailed chronological log of all observations.

2.4 RECONNAISSANCE NOTES

Reconnaissance Teams are assigned a numerical label for identification. For example, Recon Team 1-1 refers to Section 1, Team 1. The first number of the pair indicates pipeline sections. The second number indicates the area where a team conducts its reconnaissance. The team which "recons" the area farthest north in the section is Team 1 proceeding south, Recon Team 1-2 is next, and so on until the section's southern reconnaissance boundary is reached.

During winter, driving conditions are highly variable; therefore, ground reconnaissance will have to fit the circumstance. The amount of snow and conditions of streams will determine driveability and number of block points. This plan represents typical mid-winter conditions of moderate snow cover and solidly frozen streams. The plan utilizes only all terrain vehicles (ATVs) but can easily be supplemented with four-wheel-drive vehicles or snowmachines, if conditions permit.

2.5 RECONNAISSANCE ACTIONS

Following are specific reconnaissance actions for each of the reconnaissance teams assigned to the 12 recon sections.

RECONNAISSANCE ACTIONS

RECON SECTION	PUMP STATION	PLMP	TEAM	SUMMER DEPARTURE POINT	SUMMER GROUND RECONNAISSANCE GUIDELINES	SUMMER BLOCK POINTS	WINTER DEPARTURE POINT	WINTER GROUND RECONNAISSANCE GUIDELINES	WINTER BLOCK POINTS
Section 1	PS01 to PS02	(b) (7)(F), (b) (3)	1-1	Prudhoe Response Base	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Prudhoe Response Base	(b) (7)(F), (b) (3)	
			1-2	Prudhoe Response Base			Prudhoe Response Base		
Section 2	PS02 to PS03		2-1	Prudhoe Response Base		•	Prudhoe Response Base		
			2-2	Prudhoe Response Base			Galbraith Maintenance Base		
Section 3	PS03 to PS04		3-1	Galbraith Maintenance Base		• • •	Galbraith Maintenance Base		
			3-2	Galbraith Maintenance Base		• •	Galbraith Maintenance Base		
Section 4	PS04 to PS05		4-1	Galbraith Maintenance Base		• • • •	Galbraith Maintenance Base		
			4-2	Galbraith Maintenance Base		• • • •	Galbraith Maintenance Base		(b) (7)(F), (b) (3)

RECONNAISSANCE ACTIONS

RECON SECTION	PUMP STATION	PLMP	TEAM	SUMMER DEPARTURE POINT	SUMMER GROUND RECONNAISSANCE GUIDELINES	SUMMER BLOCK POINTS	WINTER DEPARTURE POINT	WINTER GROUND RECONNAISSANCE GUIDELINES	WINTER BLOCK POINTS
Section 4	[redacted]	[redacted]	4-3	Galbraith Maintenance Base	[redacted]	[redacted]	Prospect Response Base	[redacted]	[redacted]
			4-4	Prospect Response Base					
			4-5	Prospect Response Base					
			4-6	Prospect Response Base			Prospect Response Base		
Section 5	[redacted]		5-1	Prospect Response Base			Prospect Response Base		
			5-2	Prospect Response Base			Prospect Response Base		
			5-3	Yukon Response Base			Yukon Response Base		

RECONNAISSANCE ACTIONS

RECON SECTION	PUMP STATION	PLMP	TEAM	SUMMER DEPARTURE POINT	SUMMER GROUND RECONNAISSANCE GUIDELINES	SUMMER BLOCK POINTS	WINTER DEPARTURE POINT	WINTER GROUND RECONNAISSANCE GUIDELINES	WINTER BLOCK POINTS
Section 6	(b) (7)(F), (b) (3)		6-1	Yukon Response Base	(b) (7)(F), (b) (3)		Yukon Re-sponse Base	(b) (7)(F), (b) (3)	
			6-2	Fairbanks Re-sponse Base			Fairbanks		
			6-3	Fairbanks			Fairbanks		
Section 7			7-1	Fairbanks			Fairbanks		
			7-2	Fairbanks			Fairbanks		
			7-3	Fairbanks			Fairbanks		
			7-4	Fairbanks			Team 7-4 is sum		
Section 8			8-1	Fairbanks			Fairbanks		
			8-2	Delta			Delta		
			8-3	Delta			Delta		
Section 9			9-1	Delta			Delta		
			9-2	Delta			Delta		

RECONNAISSANCE ACTIONS

RECON SECTION	PUMP STATION	PLMP	TEAM	SUMMER DEPARTURE POINT	SUMMER GROUND RECONNAISSANCE GUIDELINES	SUMMER BLOCK POINTS	WINTER DEPARTURE POINT	WINTER GROUND RECONNAISSANCE GUIDELINES	WINTER BLOCK POINTS
Section 10	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	10-1	Delta	(b) (7)(F), (b) (3)		Delta	(b) (7)(F), (b) (3)	
			10-2	Delta			Delta		
			10-3	Glennallen Response Base			Glennallen Response Base		
			10-4	Glennallen Response Base			Glennallen Response Base		
Section 11	(b) (7)(F), (b) (3)		11-1	Glennallen Response Base			Glennallen Response Base		
			11-2	Glennallen Response Base			Glennallen Response Base		
			11-3	Glennallen Response Base					

RECONNAISSANCE ACTIONS

RECON SECTION	PUMP STATION	PLMP	TEAM	SUMMER DEPARTURE POINT	SUMMER GROUND RECONNAISSANCE GUIDELINES	SUMMER BLOCK POINTS	WINTER DEPARTURE POINT	WINTER GROUND RECONNAISSANCE GUIDELINES	WINTER BLOCK POINTS
Section 12	PS12 to VMT	(b) (7)(F), (b) (3)	12-1	Glennallen Response Base	(b) (7)(F), (b) (3)	• (b) (7)(F), (b) (3)	Glennallen Response Base	(b) (7)(F), (b) (3)	
			12-2	Valdez	(b) (7)(F), (b) (3)		Valdez		

RECONNAISSANCE ACTIONS

RECON SECTION	PUMP STATION	PLMP	TEAM	SUMMER DEPARTURE POINT	SUMMER GROUND RECONNAISSANCE GUIDELINES	SUMMER BLOCK POINTS	WINTER DEPARTURE POINT	WINTER GROUND RECONNAISSANCE GUIDELINES	WINTER BLOCK POINTS
Section 12	PS12 to VMT	(b) (7)(F), (b) (3)	12-3	Valdez	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Valdez	(b) (7)(F), (b) (3)	• (b) (7)(F), (b) (3) •
			12-4	Valdez	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Valdez		

Section 3. Containment Actions

3.1 INTRODUCTION

For initial response and containment actions, the pipeline is divided into *contingency areas*, each of which generally covers a distinct drainage pattern. The contingency areas are further subdivided into *segments* for purposes of containment actions, access, and environmental information. Table 3.1 provides a list of the contingency areas and their segments, along with references to the Volume 4 C-Plan Maps and Aerial Maps that depict them. A full discussion of Alyeska's response structure is found in Volume 1, Section 3.1, "Facility Description and Operational Overview."

The Operations Section Chief has full responsibility for field actions in connection with any oil spill and provides status reports to the Incident Commander. Depending on the size of the spill, relief personnel and additional resources are provided to the Operations Section Chief.

The method of transporting personnel and equipment to and from oil spills will vary with seasonal and daily weather patterns, in addition to the type of terrain and extent of constructed access at the site. The most efficient and expedient methods of transportation will be used, given site-specific and time-specific conditions. The time required for personnel and equipment to mobilize and respond to a spill site will also depend on weather, season, and site-specific conditions.

Response personnel should keep in mind that all culverts, whether listed in the plan or not, are possible block points for the movement of spilled oil. Besides the road and workpad, culverts are also located in river dikes and training structures and may be applicable depending on local conditions. The water level behind blocked culverts may have to be controlled with bypass pumping.

Containment actions given may be augmented as field conditions and reconnaissance observations suggest, especially when actions at additional locations would improve human safety or minimize environmental damage.

Specific containment instructions per segment are given in the pages to follow. Actions may be initiated simultaneously at two locations:

- At the source of the spill
- Downslope from the leading edge of the spill

3.2 HOW TO USE THIS SECTION

For initial response and containment actions, the pipeline is divided into *contingency areas*, each of which generally covers a distinct drainage pattern. The contingency areas are further subdivided into *segments* for purposes of containment actions, access, and environmental information. Table 3.1 provides a list of the contingency areas and their segments, along with references to the Volume 4 C-Plan Maps and Aerial Maps that depict them

Following Table 3.1, tables are provided for each contingency area beginning in the north at (b) (7)(F), (b) first page for each contingency area identifies priority control actions for that area, while the subsequent pages list specific information on access, assessment of spill movement, environmental sensitivities, and containment instructions for each season. Additional, more detailed data on stream hydrology of the important rivers and streams in the segment can be found in Section 6 of this volume arranged from north to south starting at (b) (7) (F), (b) These hydrology tables provide descriptions of the drainage system, as well as information on width, discharge volume, and flow velocity in different seasons. Finally, recommendations for season-specific containment methods are provided. The hydrology tables should be used in conjunction with the containment instruction provided here.

TABLE 3-1 TAPS CONTINGENCY AREAS AND SEGMENTS

CONTINGENCY AREA	NORTH MP	SOUTH MP	SEGMENT	NORTH MP	SOUTH MP	C-PLAN MAP	AERIAL
Putuligayuk River	(b) (7)(F), (b) (3)		Put River 1	(b) (7)(F), (b) (3)		2	6, 7
Sagavanirktok River 1			Sag River 1.1			2, 3	6-11
			Sag River 1.2			3-5	11-19
			Sag River 1.3			5-7	19-31
Sagavanirktok River 2			Sag River 2.1			7-10	30-44
			Sag River 2.2			10, 11	43-46
			Sag River 2.3			11	46-49
			Sag River 2.4			11, 12	49, 51, 52
			Sag River 2.5			12	51, 52
Sagavanirktok River 3			Sag River 3.1			12, 13	52
			Sag River 3.2			13	52, 53, 54
			Sag River 3.3			13	52-59
			Sag River 3.4			13	58, 59, 60
			Sag River 3.5			13	59, 60, 61
Toolik/ Kuparuk Rivers			Toolik/Kuparuk River 1			13	60, 61
			Toolik/Kuparuk River 2			13	62, 63
			Toolik/Kuparuk River 3			13	62, 63, 64
			Toolik/Kuparuk River 4			13	63, 64
			Toolik/Kuparuk River 5			13,14	64
			Toolik/Kuparuk River 6			14	64-67
			Toolik/Kuparuk River 7			14	67, 68, 69
Itkillik River			Itkillik River 1			14	69, 70
Galbraith Lake			Galbraith Lake 1			14,15	69, 70, 71
			Galbraith Lake 2			15	69-72
			Galbraith Lake 3			15	71, 72
			Galbraith Lake 4			15, 16	72, 73
Atigun River			Atigun River 1			16	72, 73, 74
			Atigun River 2			16,17	74
			Atigun River 3			17, 18	74, 80
			Atigun River 4			17, 18	80-84
North Fork Chandalar River			North Fork Chandalar River 1			17, 18	84-88
Dietrich River			Dietrich River 1			18	87, 88, 89
			Dietrich River 2			18	88, 89, 90
			Dietrich River 3			18, 19	90, 92, 93
			Dietrich River 4			18, 21	92-102
Middle Fork Koyukuk River			Middle Fork Koyukuk River 1			21	101, 102, 103
			Middle Fork Koyukuk River 2			21, 22	102-110
			Middle Fork Koyukuk River 3			22, 23	109, 110, 111
			Middle Fork Koyukuk River 4			23, 25	110-122
			Middle Fork Koyukuk River 5			25	122
			Middle Fork Koyukuk River 6			25	122, 123, 124
			Middle Fork Koyukuk River 7			25, 26	122-125
South Fork Koyukuk River			South Fork Koyukuk River 1			25,26	124, 125, 126
			South Fork Koyukuk River 2			26	125, 126
			South Fork Koyukuk River 3			26	126, 127, 128
Jim River			Jim River 1			26	127, 128, 129
			Jim River 2			26	129, 130
			Jim River 3			26	130, 132
			Jim River 4			26, 27	132-136
			Jim River 5			27	135, 136
			Jim River 6			27	136, 137
			Jim River 7			27, 28	137, 138
Bonanza/Fish Creeks			Bonanza/Fish Creeks 1			28	138, 139
			Bonanza/Fish Creeks 2			28	139, 140, 141
			Bonanza/Fish Creeks 3			28	140, 141
			Bonanza/Fish Creeks 4			28, 29	141, 142, 143
			Bonanza/Fish Creeks 5			29	143, 144
			Bonanza/Fish Creeks 6			29	143, 144
			Bonanza/Fish Creeks 7			29	144, 145
			Bonanza/Fish Creeks 8			29, 30	145, 146, 147
Kanuti River			Kanuti River 1			29, 30	146, 147, 148
			Kanuti River 2			30	148, 149
			Kanuti River 3			30, 31	149-153
West Fork Dall River			West Fork Dall River 1			31, 31E	153-156
			West Fork Dall River 2			31, 31E	155, 156, 157
			West Fork Dall River 3			31, 31E	156-159
Ray River			Ray River 1			31E, 32	158-164
			Ray River 2			33	164, 165, 166
			Ray River 3			33	165-168
			Ray River 4			33	166-169
			Ray River 5			33	168, 169, 170
			Ray River 6			33, 34	169, 170, 171
			Ray River 7			33, 34	170, 171, 172
			Ray River 8			34	171, 172, 173
			Ray River 9			34	172, 173, 174
			Ray River 10			34	173, 174, 175

TABLE 3-1 (CONTINUED) TAPS CONTINGENCY AREAS AND SEGMENTS

CONTINGENCY AREA	NORTH MP	SOUTH MP	SEGMENT	NORTH MP	SOUTH MP	C-PLAN MAP	AERIAL
Yukon River	(b) (7)(F), (b) (3)		Yukon River 1	(b) (7)(F), (b) (3)		34	174, 175
			Yukon River 2			34	175
			Yukon River 3			34	175
			Yukon River 4			34	175, 176, 177
			Yukon River 5			34	175, 176, 177
			Yukon River 6			34	175, 176, 177
			Yukon River 7			34	177
			Yukon River 8			34	177, 178
			Yukon River 9			34, 35W	177-180
Isom Creek			Isom Creek 1			34, 35W	179, 180, 181
			Isom Creek 2			34, 35	180-183
Hess Creek			Hess Creek 1			35	182, 183
			Hess Creek 2			35	183
			Hess Creek 3			35	183, 184
			Hess Creek 4			35	183, 184
			Hess Creek 5			35, 36	184-190
			Hess Creek 6			36	190, 191, 192
			Hess Creek 7			36	191-198
			Hess Creek 8			36, 37	197, 198
Tolovana River			Tolovana River 1			37	197, 198, 199
			Tolovana River 2			37	199-202
			Tolovana River 3			37	201, 202, 203
			Tolovana River 4			37	202, 203
			Tolovana River 5			37, 38	202, 203, 204
			Tolovana River 6			37, 38	203-206
			Tolovana River 7			37, 38	206, 207
Tatalina River			Tatalina River 1-2			38	206, 207, 208
			Tatalina River 3			38	208, 209, 210
			Tatalina River 4			38	209, 210, 211
			Tatalina River 5			38	210, 211, 212
			Tatalina River 6			38	211, 212
			Tatalina River 7			38, 39	211, 212
			Tatalina River 8			38, 39	212, 213
			Tatalina River 9			38, 39	212, 213, 214
			Tatalina River 10			39	214, 216
Washington/ Aggie Creeks			Washington/Aggie Creeks 1			39	216, 217
			Washington/Aggie Creeks 2			39	217, 218
			Washington/Aggie Creeks 3			39	218, 219
			Washington/Aggie Creeks 4			39, 40	219
			Washington/Aggie Creeks 5			39, 40	219
			Washington/Aggie Creeks 6			40	219, 220
			Washington/Aggie Creeks 7			40	219- 222
Chatanika River			Chatanika River 1			40	221-224
			Chatanika River 2			40	222-225
			Chatanika River 3			40	224, 225, 226
			Chatanika River 4			40	225, 226
			Chatanika River 5			40, 41	225, 226, 228
			Chatanika River 6			40, 41W	226, 228, 229
Goldstream Creek			Goldstream Creek 1			41W	228, 229
			Goldstream Creek 2			41, 41W	228, 229
			Goldstream Creek 3			41, 41W	228, 229
			Goldstream Creek 4			41, 41W	229, 230
			Goldstream Creek 5			41, 41W	229, 230, 232
			Goldstream Creek 6			41	232, 234
Chena River			Chena River 1			41	232, 233, 234
			Chena River 2			42	233-237
			Chena River 3			42, 43	236-242
			Chena River 4			42, 43	242, 243, 244
Moose/French Creeks			Moose/French Creeks 1			42, 43	243-246
			Moose/French Creeks 2			43	245, 246, 247
			Moose/French Creeks 3			43	246-255
			Moose/French Creeks 4			43, 44	253, 254, 255
Little Salcha			Little Salcha 1			44	254, 255
			Little Salcha 2			44	255, 256
			Little Salcha 3			44	256, 257
Salcha River			Salcha River 1			44, 44E, 45	257-260
			Salcha River 2			44, 44E, 45	259-263
			Salcha River 3			45	262, 263, 264
			Salcha River 4			45	264, 265
			Salcha River 5			45	264-268
Shaw Creek			Shaw Creek 1			45, 46	267-270
			Shaw Creek 2			46	269-272
			Shaw Creek 3			46, 47	272-277
Big Delta/ Delta Junction			Big Delta - Delta Junction 1			47	277, 278
			Big Delta - Delta Junction 2			47	278, 279
			Big Delta - Delta Junction 3			47	279
			Big Delta - Delta Junction 4			47	279, 280
			Big Delta - Delta Junction 5			47	279, 280, 281

TABLE 3-1 (CONTINUED) TAPS CONTINGENCY AREAS AND SEGMENTS

CONTINGENCY AREA	NORTH MP	SOUTH MP	SEGMENT	NORTH MP	SOUTH MP	C-PLAN MAP	AERIAL
	(b) (7)(F), (b) (3)		Big Delta - Delta Junction 6	(b) (7)(F), (b) (3)		47	280, 281, 282
			Big Delta - Delta Junction 7			47	281, 282
			Big Delta - Delta Junction 8			47	282, 283
			Big Delta - Delta Junction 9			47, 48	282, 283
			Big Delta - Delta Junction 10			48	284, 285
Jarvis Creek			Jarvis Creek 1			48	284, 285
			Jarvis Creek 2			48	284, 285, 286
			Jarvis Creek 3			48, 49	286, 287
			Jarvis Creek 4			48, 49	287
			Jarvis Creek 5			49	287, 288, 289
			Jarvis Creek 6			49	289, 290
			Jarvis Creek 7			49, 50	290-293
Delta River			Delta River 1			50, 51	293-297
			Delta River 2			51	297, 298
			Delta River 3			51, 52	298-300
			Delta River 4			52	300-304
			Delta River 5			52	303, 304
			Delta River 6			52, 53	304-307
Trashy Mountain			Trashy Mountain 1			53	307, 308
Phelan Creek			Phelan Creek 1			53, 54	307-310
			Phelan Creek 2			53, 54	310
			Phelan Creek 3			54	310, 311
			Phelan Creek 4			54	310, 311, 312
			Phelan Creek 5			54	311, 312, 313
			Phelan Creek 6			54	312, 313
			Phelan Creek 7			54	313, 314
Paxson/Summit Lakes			Paxson - Summit Lakes 1			54	314, 315
			Paxson - Summit Lakes 2			54	314, 315
			Paxson - Summit Lakes 3			54	315
			Paxson - Summit Lakes 4			54, 55	315, 316
			Paxson - Summit Lakes 5			54, 55	316, 317
			Paxson - Summit Lakes 6			55	316, 317
			Paxson - Summit Lakes 7			55	316, 317
			Paxson - Summit Lakes 8			55	318
			Paxson - Summit Lakes 9			55	318
			Paxson - Summit Lakes 10			55	318
			Paxson - Summit Lakes 11			55	319
			Paxson - Summit Lakes 12			55	319
			Paxson - Summit Lakes 13			55	319, 320
			Paxson - Summit Lakes 14			55	320, 321
			Paxson - Summit Lakes 15	(b) (7)(F), (b) (3)		55, 56	320, 321
			Paxson - Summit Lakes 16			56	321, 322
			Paxson - Summit Lakes 17			56	322, 323
			Paxson - Summit Lakes 18			56	323, 324
			Paxson - Summit Lakes 19			56	324
			Paxson - Summit Lakes 20			56, 57	324, 325
			Paxson - Summit Lakes 21			56, 57	325
Spring Creek			Spring Creek 1			57	325, 326
			Spring Creek 2			57	326, 327
			Spring Creek 3			57	327, 328
			Spring Creek 4			57	328
			Spring Creek 5			57, 58	328, 329, 330
Haggard/Sourdough Creeks			Haggard/Sourdough Creeks 1			57, 58	328, 329, 330
			Haggard/Sourdough Creeks 2			58	329, 330, 331
			Haggard/Sourdough Creeks 3			58	331
			Haggard/Sourdough Creeks 4			58	332
			Haggard/Sourdough Creeks 5			58	332
Gulkana River			Gulkana River 1			58, 59	332-335
			Gulkana River 2			59	335
			Gulkana River 3			59-61	335-342
Dry Creek			Dry Creek 1			61, 62	342-347
Tazlina River			Tazlina River 1			62	346, 347
			Tazlina River 2			62	347, 348
			Tazlina River 3			62	349
			Tazlina River 4			62, 63	349, 350
			Tazlina River 5			63	349-352
Yetna Creek			Yetna Creek 1			63	352-355
Klutina River			Klutina River 1			63	355, 356
Copper River			Copper River 1			64	355-361
Willow Creek			Willow Creek 1			64	360, 361, 362
			Willow Creek 2			64, 65	362-365
			Willow Creek 3			65	364, 365
			Willow Creek 4			65	365, 366
Tonsina River			Tonsina River 1			65	366, 367
			Tonsina River 2			65, 66	367-370
Little Tonsina River			Little Tonsina River 1			66, 67	369-373
			Little Tonsina River 2			67	373, 374
			Little Tonsina River 3			67	374, 375
			Little Tonsina River 4			67	374, 375, 376
			Little Tonsina River 5			67	374-379

TABLE 3-1 (CONTINUED) TAPS CONTINGENCY AREAS AND SEGMENTS

CONTINGENCY AREA	NORTH MP	SOUTH MP	SEGMENT	NORTH MP	SOUTH MP	C-PLAN MAP	AERIAL
Tiekel River	(b) (7)(F), (b) (3)		Tiekel River 1	(b) (7)(F), (b) (3)		67, 68	379-385
			Tiekel River 2			68, 69	385, 386, 387
Tsina River			Tsina River 1			68, 69	387, 388
			Tsina River 2			69	388, 389, 390
			Tsina River 3			69	390, 391, 392
			Tsina River 4			69	392, 393, 394
			Tsina River 5			69,70	393-396
			Tsina River 6			70	395, 396

CONTINGENCY AREA	NORTH MP	SOUTH MP	SEGMENT	NORTH MP	SOUTH MP	C-PLAN MAP	AERIAL
			Tsina River 7	(b) (7)(F), (b) (3)		70	396-399
Lowe River	(b) (7)(F), (b) (3)		Lowe River 1			70	398, 399, 400
			Lowe River 2			70	399-402
			Lowe River 3			70	401, 402, 403
			Lowe River 4			70, 71	402, 403, 404
			Lowe River 5			71, 72	403-411
			Lowe River 6			71, 72	410, 411

(b) (7)(F), (b) (3)
PUTULIGAYUK RIVER

PUTULIGAYUK RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Prudhoe Bay and Beaufort Sea (fish and waterfowl) 2. Tundra, Marshes, and Ponds (waterfowl)	The Putuligayuk (Put) River Contingency Area is bounded by Prudhoe Bay on the north and (b) (7) on the south. PS01, the northernmost point of TAPS, is at the northern end of the 11.2-mile-long area. The pipeline crosses relatively flat and lake-dotted tundra just south of Prudhoe Bay. Oil would tend to stay near the pipeline unless it reaches one of the small streams in the area. A spill along the pipeline between PS01 and (b) (7)(F), (b) tend to move northwest toward a small tributary of the Put R. while a spill between (b) (7)(F), (b) (3) toward Grayling Gulch or stay near the pipeline, except during breakup when much of the area is covered with water. The streams in this area flow north to the Put R. and Prudhoe Bay.	1. If oil has entered or threatens to enter Put R, an IRT will mobilize and proceed to CS1-1 on the Spine Rd crossing of Put R and either deploy diversion boom across Put R (if sufficient flows warrant) or block Spine Rd culverts (use underflow bypass systems if required). If oil is not evident, remain at CS1-1 and maintain continuous radio contact with the reconnaissance team. If oil bypasses CS1-1, proceed to CS1-0 near the Central Compressor Plant on West Dock Rd and deploy boom and/or block culverts as appropriate. If spill is between (b) (7)(F), (b) , proceed to where Grayling Gulch Crk crosses Spine Rd east of PS01. Deploy diversion boom at CS1-2 upstream of culvert, if water is flowing in the stream channel. Use underflow bypass systems if required. Maintain containment equipment at these locations until it is determined that no oil will enter Prudhoe Bay from Put R or Grayling Gulch Crk drainages. 2. Move an IRT to CS1-3 if spill is between PS01 and (b) (7)	Summer Actions 1 and 2. Put R and Grayling Gulch drainage systems are likely to be dry during freezeup. If so, the culverts should be blocked.	Summer Actions 1 and 2.	Summer Actions 1 and 2. Put R and Grayling Gulch Crk have a distinct breakup flood flow that lasts for 10 to 20 days. The channel will fill completely and overflow its banks in some locations, but there will be little flowing ice and debris. Where the channel is wide, the velocity will be low, and booming operations can be employed. Consider compensating for the water-level fluctuations.

CONTAINMENT INSTRUCTIONS

The Put River Contingency Area has only one segment. Specific containment instructions are provided for this segment; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downstream from the leading edge of the spill.

(b) (7)(F), (b) (3)

PUTULIGAYUK RIVER

CONTAINMENT INSTRUCTIONS FOR PUTULIGAYUK RIVER 1 SEGMENT

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
PUTULIGAYUK RIVER 1 (b) (7)(F), (b) (3)	1. Prudhoe Bay and Beaufort Sea (fish and waterfowl) 2. Tundra, Marshes, and Ponds (waterfowl)	By air, by direct access to workpad from PS01, and via pipeline workpad from hwy by taking AR 135-APL/AMS-3.	(b) (7)(F), (b) (3) lake bed 1 mile east of Put R. Most oil will remain in lake bed. Uncontained oil will spread overland toward Put R tr butary. (b) (7)(F), (b) (3) will flow north from pipeline onto relatively flat terrain. May reach small ponds near pipeline but will I kely be retained by ground cover. Oil movement on ponds probably will be in direction of wind. Old exploratory road crossing workpad at (b) (7)(F), ay allow oil to flow to tributary of Put R that flows northeast into Prudhoe Bay. (b) (7)(F), (b) Oil will move away from pipeline onto relatively flat terrain. Area dotted with numerous lakes and ponds; several are close to pipeline, and oil may flow into several bodies of water. Several small streams meander through tundra, flowing north to Put R and connecting several lakes near pipeline. Largest stream (Grayling Gulch Crk) crosses pipeline a (b) (7)	Primary environmental objectives are: 1. Keep oil from reaching Put R. 2. Keep oil from spreading through lake systems connected by small streams. 3. Keep oil from reaching Prudhoe Bay. Soil is highly erodible due to frozen silt to depth of 8 ft. High ice content makes area highly susceptible to thermal erosion. Disturbance of vegetative mat may result in settling and subsidence with possible erosion near stream banks. Waterfowl are present in Put R drainage and wetland habitat surrounding pipeline workpad. Arctic grayling observed in Grayling Gulch Crk during summer and may occur in Put R.	The first objective is to keep oil from reaching either Put R or Grayling Gulch Crk. If oil enters these watercourses, objective is to keep oil from reaching Prudhoe Bay. 1. Confine spill to workpad at source using materials found on workpad to construct containment barriers. (b) (7)(F), (b) (3) of pump station. Block drainage ditch at edge of old lake bed. 3 (b) (7)(F), (b) Block drainage ditch at CS1-3 using available materials. Install water bypass culverts if needed. Block LWC at (b) (7) Use helicopters to deploy booms across lakes and ponds as necessary. (b) (7)(F), (b) (3) Block appropriate LWCs. If oil reaches or will enter Grayling Gulch Crk, block creek upstream from pipe crossing at (b) (7) Deploy booms across lakes and ponds as necessary. If oil enters a lake through a tributary stream, boom lake at outlet to keep oil from leaving lake. If oil flows overland into lake, boom affected shoreline. Prevailing winds may concentrate oil which reaches lakes on southwest shorelines.	Summer Actions 1 through 4. Put R and Grayling Gulch Crk will I kely be dry except for some ponding.	Summer Actions 1 through 4. Use snow berms; most oil will remain near pipeline.	Summer Actions 1 through 4. Water may cover flat terrain. Timing is critical to prevent rapid spread of oil. Extensive use of booms may be required.

C-PLAN MAPS	2
AERIAL MAPS	6, 7
CONTAINMENT SITES	1-0, 1-1, 1-2, 1-3
AVAILABLE DYNAMIC VOLUME (BBL)	29,408

SAGAVANIRKTOK RIVER 1 CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	POTENTIAL CONTAINMENT SITES	PRIORITY CONTROL ACTIONS			
			SUMMER	FREEZEUP	WINTER	BREAKUP
1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors waterfowl) 3. Tundra, Marshes, and Ponds (waterfowl)	The Sagavanirktok River 1 Contingency Area (b) (7)(F), (b) (3)	Seasonal weather conditions cause the Sag R flow to fluctuate and active channels in the braided system to change seasonally. Few specific containment sites are designated on the river in this area, but locations where containment is possible under some water conditions are identified below. Reconnaissance teams should evaluate these sites, in addition to (b) (7)(F), (b) (3)	If oil enters or threatens to enter the Sag R, move to the Sag River 1 Contingency Area via the Dalton Highway or helicopter, if available. The IRTs must maintain contact with the reconnaissance teams patrolling the pipeline route for direction and status of the spill. Each IRT may respond to the following functions which will be performed accordingly: If oil flows into the Sag, or could potentially flow into the river, dispatch response teams to CS1-1A, CS1-1B, or to the nearest usable containment site as selected by reconnaissance personnel. Depending on the oil's location, deploy booms and build berms at the appropriate location to divert oil to the west side channels for containment. It may be necessary to plug channels or construct pits for oil storage. An IRT may proceed to a location downstream from the spill site on the Sag River floodplain. The objective is to contain as much oil as possible on the vegetated terrace, on the gravel floodplain, or in side channels. In the vicinity of the spill site, the small channels may be bermed on the downstream end to prevent oil from reaching flowing water. The upstream end may be dammed or bermed to prevent a rise in water level from flushing the oil into active channels. Where the pipeline is below ground or if the oil seeps into the permeable gravel materials, the IRT may also excavate a series of transverse ditches across the floodplain to a depth below the water table to intercept the subsurface flow of oil. An IRT may move to the spill site and implement containment actions at and near the leak source.	Summer Actions 1 through 3. The flow in the Sag R will be low and probably restricted to one or two channels. Special efforts will be required to keep booms free of ice, and 24-hour boom maintenance may be required.	Summer Actions 2 and 3. The IRT assigned to Control Action 1 will proceed downslope of the spill site and build snow berms surrounding the spill area.	Summer Actions 1 through 3. During peak flow, all channels and the floodplain may be inundated with water flowing at high velocities. Action 1 will be difficult to implement. Reconnaissance will be necessary to place this IRT for maximum efficiency and personnel safety. Emphasize Actions 2 and 3 to keep as much oil as possible from entering flowing water.

CONTAINMENT INSTRUCTIONS

The Sagavanirktok River 1 Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill. The primary objective in containing a spill is to keep oil from reaching flowing water of the Sag R or its side channels and tributaries. However, if oil has reached the river from a leak in or adjacent to the river, the primary objective is to contain the oil as close to the spill as possible so that oil will not spread through the braided system of the Sag R. At normal low flow during the ice-free season, containment and diversion of oil on the main river is feasible. The best method is to use multiple diversion booms in a series to divert oil from a main channel to a secondary channel. The secondary channel should be one which contains standing water or some flowing water which can be dammed with either overflow or underflow structures to facilitate oil recovery. It is impractical to pinpoint containment sites in a changing floodplain; therefore, the Response Supervisor will determine the best site after the spill is located.

During winter, the Sag R freezes to the bottom except in some areas where perennially flowing intragravel water surfaces. A winter spill from the pipeline adjacent to the active floodplain may surface and be contained relatively close to the spill site, because most will be overland flow. If a leak develops from pipe buried in the active floodplain gravel, oil may enter the intragravel water system below the Sag R channel. Any spill in such an area may not become visible until water and oil surface in aufeis fields.

During high flow (rain or breakup), effective containment of oil may be limited to the area where oil enters the river.

[redacted]

SAGAVANIRKTOK RIVER 1

CONTAINMENT INSTRUCTIONS FOR SAGAVANIRKTOK RIVER 1 SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK [redacted] **C-PLAN MAPS: 2, 3** **AERIAL MAPS: 6 through 11** **CONTAINMENT SITES: 1-1A, 1-1B, 1-4** **AVAILABLE DYNAMIC VOLUME (BBL): 12,021**	1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors waterfowl) 3. Tundra, Marshes, and Ponds (waterfowl)	By air, from PS01 via Spine Rd, or from Dalton Hwy by taking AR 135-APL-3, 135-APL/AMS-1N, 135-AMS-15, 134-AMS-3B or hwy crossing of [redacted]	Pipeline crosses lake-dotted, flat but hummocky tundra. Larger lakes have drainage outlets and streams flow toward Sag R. Numerous minor drainages crisscross pipeline route. Poorly drained depressions may contain oil naturally. It is unlikely a spill will reach Sag R unless it reaches a through-flowing stream. Sag R in this segment is braided, has many gravel bars, and flows north to Beaufort Sea. Oil may reach Dalton Hwy and may be contained by hwy shoulder. AR 135-APL/AMS-3 also could contain oil moving north.	Primary environmental objectives are: 1. Keep oil from reaching Sag R. 2. Keep oil from spreading through pond and lake systems connected by small streams. 3. Keep oil from reaching Beaufort Sea. 4. Minimize aircraft disturbance during raptor nesting (April 15 to Aug 31). Soils are highly erodible and subject to thermal erosion or subsidence due to frozen silt and massive ice to a depth of 6 ft. Exercise extreme care not to disturb or remove vegetative mat. Fish and waterfowl are present in Sag R drainage. Peregrine falcon nesting occurs in [redacted]). An oil spill can affect food sources of raptors. Greatest potential effect would be disturbance of nesting birds by surveillance and cleanup activities.	[redacted]	Summer Actions 1 through 5.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 5. Summer Action 2 is critical to stop flow of oil at Dalton Hwy. Because of flat terrain and amount of water, blocked culverts must be maintained to ensure water passage while trapping oil.
SAGAVANIRKTOK RIVER 1.2 [redacted] **C-PLAN MAPS: 3, 4, 5** **AERIAL MAPS: 11 through 19** **CONTAINMENT SITES: 1-1A, 1-1B, 1-4, 1-5** **AVAILABLE DYNAMIC VOLUME (BBL): 16,279**	1. Beaufort Sea (fish, waterfowl) 2. Sagavanirktok R (fish, raptors, waterfowl) 3. Tundra, Marshes, and Ponds (waterfowl)	By air or from the Dalton Hwy via road crossing. Access roads are as follows: • 134-APL/AMS-3A • 132-APL/AMS-4B • 134-APL/AMS-1 • 132-APL/AMS-4A • 133-APL/AMS-4 • 132-APL/AMS-2 • 133-APL/AMS-3	Pipeline traverses Sag R floodplain, which is tundra dissected by minor drainages and has numerous abandoned river channels, sloughs, and depressions. These features may help contain an oil spill naturally. Pipeline tends to parallel and lie close to west edge of river. In some sections, pipeline enters river and crosses minor channels, sloughs, and gravel bars. [redacted] pipeline is farther from edge of river floodplain. An oil spill would drain toward two side channels paralleling buried pipe. These channels contain water only during breakup. At [redacted] pipeline to west near north boundary of segment. An oil spill north of here may reach hwy. [redacted]	Primary environmental objectives are: 1. Keep oil from reaching main channels of Sag R. 2. Keep oil from reaching other channels by containing oil as close to source of spill as poss ble. 3. Keep oil from reaching Beaufort Sea. 4. Minimize aircraft disturbance during raptor nesting (April 15 to Aug 31). Soils are highly erodible due to frozen silt and massive ice (0 to 6 ft), with exception of sand and gravel of floodplain, which are relatively erosion-resistant. Fish and waterfowl are present in Sag R drainage. Peregrine falcon nesting occurs in [redacted] oil spill can affect food sources of these raptors. Greatest potential effect would be disturbance of nesting birds by surveillance and cleanup activities.		Summer Actions 1 through 8.	Summer Actions 1 through 8, except use snow berms.	Summer Actions 1 through 8. Additional booms may be needed because of increased chance of oil reaching main channels.

SAGAVANIRKTOK RIVER 1 SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK (b) (7)(F), (b) (3)	1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors, waterfowl) 3. Tundra, Marshes, and Ponds (waterfowl)	By air or on ground via pipeline workpad from Dalton Hwy via the following access roads: • 131-APL/AMS-3 • 129-APL-3 • 131-APL/AMS-2 • 129-APL/AMS-2 • 131-APL-1 • 129-APL/AMS-1 • 130-APL/AMS-5 • 128-APL-3A • 130-APL/AMS-2 • 128-APS-1B • 130-APL-2 • 128-APL-1A • 130-APL-1 • 128-APL-1 Preferred route will depend on location of spill.	Sag R is braided, has many gravel bars, and flows north to Beaufort Sea. Floodplain is vegetated and dissected by minor drainages with numerous abandoned river channels, sloughs, and depressions. Except during spring breakup, floodplain features may contain oil leaking from pipeline if there is no direct drainage to river. Spilled oil would probably flow on both sides of pipeline into numerous abandoned river channels which cross pipeline route and drain north to Sag R. Segment contains approx. 33 drainage structures. Exceptions to general drainage trend occur when pipeline is close to edge of river. In these areas, timing is critical to keep oil from main river. Dalton Hwy is west of pipeline and tends to parallel route. Oil may reach hwy at a number of points, particularly culverts at (b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching Sag R. 2. Contain oil in side channels of Sag R where pipe underlies active floodplains. 3. Keep oil from reaching Beaufort Sea. 4. Minimize aircraft disturbance during raptor nesting (April 15 to Aug 31). Fish and waterfowl are present in Sag R drainage. Raptors (particularly gyrfalcon, rough-legged hawk, and peregrine falcon in Franklin Bluff and Sagwon Bluff areas) also frequent area but are less likely to be directly affected by spill. Arctic grayling and Arctic char use Sag R side channels during breakup and open water (May to Sept). Critical periods for Arctic grayling spawning and incubation occur during May and June. Some side channels, especially Ghost (b) (7)(F), (b) (3)	1. Confine spill to pad by using workpad materials to build barriers. Where there is no workpad, confine spill to pipeline right-of-way using materials found on active floodplain to build berms and channel plugs. Channel plugs may require underflow culverts to bypass water. Block affected drainage structures. 2. Block drainage structures along Dalton Hwy in affected areas. Oil may flow toward road between (b) (7)(F), (b) (3) 3. For spill between (b) (7)(F), (b) (3) 48.0, oil is l kely to reach a Sag R channel. Use booms to contain oil in side channels. If oil gets into main channel, deploy diversion booms and build berms at containment areas as recommended by response personnel. For spill between (b) (7)(F), (b) (3) gravel to berm and keep oil from main channel. If necessary, use booms to divert back to shore any oil that reaches main channel. If oil reaches a primary channel of Sag R, place diversion boom at first site downstream where oil can be diverted to an inactive river channel on west bank. Ditching may be needed between main river channel and containment channel. If spill reaches secondary or inactive channels of Sag R, use channels and natural depressions as containment sites. Use floodplain gravel to build overflow and underflow dams and berms. 4. If oil seeps through permeable thaw-stable soil, build series of transverse ditches (to below water table) downslope from spill site. From (b) (7)(F), (b) pipe is buried, and oil from leak may flow along pipe. Downslope from leak source, transverse ditches (sumps) may be dug across pipeline to contain oil.	Summer Actions 1 through 4.	Summer Actions 1 through 4, except use snow berms.	Summer Actions 1 through 4. Additional booms will be required during high flows.

C-PLAN MAPS	5, 6, 7
AERIAL MAPS	19 through 31
CONTAINMENT SITES	–

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

SAGAVANIRKTOK RIVER 1

SAGAVANIRKTOK RIVER 2 CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors waterfowl) 3. Tundra, Marshes, and Ponds (waterfowl)	(b) (7)(F), (b) (3)	1. If oil has entered or threatens to enter Sag R, move to the Sag River 2 Contingency Area via the Dalton Hwy or helicopter, and maintain radio contact with reconnaissance teams patrolling pipeline route for spill direction and status. 2. If oil has flowed or could potentially flow into Sag R, dispatch IRT to the nearest usable containment site as selected by the Operations Section Chief. IRTs should deploy a series of diversion booms across the river at that site. The oil will be diverted to the gravel floodplain where a depression, spur dike, gravel pit, or abandoned channel exists. An excavated pit may be required in place of a portable storage tank. 3. An IRT will proceed to a location downslope from the spill site on the Sag R floodplain with the objective of containing as much oil as possible on the vegetated terrace, on the gravel floodplain, or in side channels. In the spill vicinity, the small channels may be bermed on the downstream end to keep oil from reaching water. The upstream end may be dammed or bermed to keep a rise in water level from flushing oil into active channels. Where pipeline is below ground or if oil seeps into permeable gravel material, the IRT also may excavate a series of transverse ditches across floodplains to a depth below the water table to intercept subsurface oil flow. 4. Implement containment actions at or near the leak source.	Summer Actions 1 through 4. Flow in Sag River could be low and probably restricted to one or two channels. Special efforts may be required to keep booms free of ice (e.g., 24-hour maintenance).	Summer Actions 3 and 4. The IRT assigned to Action 1 will proceed downslope of the spill site and construct snow berms surrounding spill area.	Summer Actions 1 through 4. During peak flow, all channels and the floodplain may be inundated with high-velocity water. Therefore, select containment sites carefully to ensure personnel safety. Action 1 may not be possible. Emphasize Actions 3 and 4 to keep as much oil as possible from entering flowing water. Containment of a spill on east side of Sag R will require helicopter support for personnel and equipment transportation.

CONTAINMENT INSTRUCTIONS

The Sagavanirktok River 2 contingency area is divided into five segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

The primary objective in containing a spill is to keep oil from reaching flowing water of the Sag R or its side channels and tributaries. However, if oil has reached the river from a leak in or adjacent to the river, the primary objective is to contain the oil as close to the spill as possible so that oil will not spread through the braided system of the Sag R. At normal low flow during ice-free season, containment and diversion of oil on the main river is feasible. The best method is to use multiple diversion booms in a series to divert oil from a main channel to a secondary channel. The secondary channel should be one which contains standing water or some flowing water which can be dammed with either overflow or underflow structures to facilitate oil recovery. It is impractical to pinpoint containment sites in a changing floodplain; therefore, the Response Supervisor will determine the best site after the spill is located.

During winter, the Sag R freezes to the bottom except in some areas where perennially flowing intragravel water surfaces. A winter spill from the pipeline adjacent to the active floodplain may surface and be contained relatively close to the spill site, because most will be overland flow. If a leak develops from pipe buried in the active floodplain gravel, oil may enter the intragravel water system below the Sag R channel. Any spill in such an area may not become visible until water and oil surface in aufeis fields.

During high flow (rain or breakup), effective containment of oil may be limited to the area where oil enters the river.

(b) (7)(F), (b) (3)

SAGAVANIRKTOK RIVER 2

CONTAINMENT INSTRUCTIONS FOR SAGAVANIRKTOK RIVER 2 SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK RIVER 2.1 (b) (7)(F), (b) (3) **C-PLAN MAPS** 7 through 10 **AERIAL MAPS** 30 through 44 **CONTAINMENT SITES** 2-0 (b) (7)(F), (b) (3)	1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors, waterfowl) 3. Tundra, Marshes and Ponds (waterfowl)	By air or on ground via pipeline workpad from Dalton Hwy via the following access roads: (b) (7)(F) all seasons. During winter, a trail can be bladed across river for access by 4-wheel-drive vehicles to workpad on east bank. Avoid extensive river aufeis to make crossing safe and workable. Access from right-of-way is by helicopter or ATV (Rolligon) during summer. Tracked vehicles can be used during winter, although vegetative cover in sensitive areas must not be disturbed. ATVs can be used summer and winter on floodplain gravels.	(b) (7)(F), (b) (3)		1. Confine spill on pad at source of leak; use materials from workpad (or from OMS 127-1 via 127-AMS-2) to build containment barriers. Where no workpad, use materials from active gravel floodplain and confine spill to pipeline right-of-way by building barriers. Block affected drainage structures and use water bypass systems, if required. 2. If oil seeps from buried pipe, a series of transverse ditches (sumps) may be dug across pipeline right-of-way to a depth below pipe. 3. Block affected drainages upstream from their confluence with Sag R. Except during breakup, floodplain features such as sloughs, meanders, depressions, and abandoned river channels could be used to contain oil. 4. Spills into main channels of Sag R may be contained and diverted with booms. Place diversion booms at first downstream site where oil can be diverted to an inactive river channel on west bank. To help oil diversion, earthmoving equipment may be needed to dig a ditch between main channel and to modify containment channel. Booms may be required. Because floodplain channels change, reconnaissance at time of spill will be needed to select booming sites. 5. If spill occurs between (b) (7)(F), (b) (3) spur dikes for oil containment. Most spur dikes have culverts which can be plugged.	Summer Actions 1 through 5.	Summer Actions 1 through 3 and 5, except use snow berms.	Summer Actions 1 through 5. During peak flow, all channels and floodplain may be inundated with water flowing at high velocities. Action 4 may be difficult to implement. Consider this when selecting containment sites to ensure personnel safety. Reconnaissance will be necessary to locate a containment area that will provide maximum containment efficiency and ensure personnel safety of IRTs. Emphasize keeping oil from entering Sag R. Install culvert blocking and berms at all cross-drainages on Dalton Hwy and maintain them to ensure water passage while trapping oil.
SAGAVANIRKTOK RIVER 2.2 (b) (7)(F), (b) (3) **C-PLAN MAPS** 10, 11 **AERIAL MAPS** 43 through 46 **CONTAINMENT SITES** 2-1, 2-2, 2-2A, 2-3, 2-6, 2-7 (b) (7)(F), (b) (3)	1. Beaufort Sea (fish waterfowl) 2. Sag R (fish, raptors, waterfowl) 3. Tundra, Marshes and Ponds (waterfowl)	(b) (7)(F), (b) (3)			1 (b) (7)(F), (b) (3) 2 3 4 5 6	Summer Actions 1 through 6. Flow in unnamed creeks could be low, and booms will not be required. Booms in Sag R may need continual maintenance to keep them ice-free.	Summer Actions 1 through 5. Use snow berms to block drainages downslope from spill.	Summer Actions 1 through 6. During peak flow, all channels and floodplain may be inundated with water flowing at high velocities. Consider this when selecting containment sites to ensure personnel safety. Action 6 may be difficult to implement. Emphasize keeping oil from entering Sag R. Install culvert blocking and berms at all cross-drainages on Dalton Hwy and maintain them to ensure water passage while trapping oil.

(b) (7)(F), (b) (3)

SAGAVANIRKTOK RIVER 2

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK RIVER 2.3 (b) (7)(F), (b)	1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors, waterfowl) 3. Tundra, Marshes and Ponds (waterfowl) **C-PLAN MAPS**: 11 **AERIALS**: 46 through 49 **CONTAINMENT SITES**: 2-4A, 2-5, 2-6, 2-7 **AVAILABLE DYNAMIC** [redacted]: (b) (7)	(b) (7)(F), (b) (3)	Oil will flow toward and onto Sag R floodplain. Pipeline descends from river terrace to Sag floodplain and heads south paralleling base of terrace. (b) (7)(F), (b) (3) [redacted] rom reaching Sag R.	Primary environmental objectives are: 1. Keep oil from reaching Sag R. 2. Keep oil from reaching sensitive fish streams tributary to Sag R. 3. Keep oil from reaching Beaufort Sea. Soils are highly erodible due to frozen silt and high ice content to a depth of over 15 ft. On floodplain, frozen silty sand and gravel are overlain by 5 ft of frozen silt. Vegetative mat on terrace should not be disturbed. Fish and waterfowl are present in Sag R floodplain. Besides Sag R, fish streams cross this segment at (b) (7) [redacted] streams contain Arctic grayling during summer.	1. (b) (7)(F), (b) (3) [redacted] drainage from it with booms. 4. If oil reaches or might reach active floodplain, deploy booms at drainage outlets to keep oil from entering Sag R. Use west bank side channels for containment sites. Three sites (CS2-5, CS2-6, and CS2-7) on Sag R, where oil could be contained during certain flow conditions, should be evaluated during reconnaissance. Ditching and berming along edge of floodplain to catch oil from small drainages or river bank may be used.	Summer Actions 1 through 4.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 4. During peak flow, all channels and floodplain may be inundated with water flowing at high velocities. Consider this when selecting containment sites to ensure personnel safety. Action 4 may be difficult to implement. Emphasize keeping oil from entering Sag R. Install culvert blocking and berms at all cross-drainages on Dalton Hwy and maintain them to ensure water passage while trapping oil.
SAGAVANIRKTOK RIVER 2.4 (b) (7)(F), (b) (3)	1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors, waterfowl) 3. Tundra, Marshes and Ponds (waterfowl) **C-PLAN MAPS**: 11, 12 **AERIAL MAPS**: 49, 51, 52 **CONTAINMENT SITES**: 2-5, 2-6, 2-7 (b) (7)(F), (b) (3): [redacted]	[redacted]	Oil will flow east toward Sag R floodplain in numerous intermittent drainages. Sag R floodplain has several small lakes, abandoned river channels, and depressions that may contain oil temporarily. A small lake near south boundary of segment may be affected by oil flow. Oil may reach Dalton Hwy and should be contained there by blocking drainage culverts. Hwy is most effective containment structure in segment. Pipeline is elevated throughout segment.	Primary environmental objectives are: 1. Keep oil from reaching Sag R. 2. Keep oil from reaching tr butary streams. 3. Keep oil from reaching Beaufort Sea. Soils are extremely erodible due to frozen silt and high ice content. Ice can be found just below vegetative mat at many locations. Do not disturb vegetative mat. (b) (7)(F), (b) (3) [redacted]	Initial containment action should be to attempt to keep oil from bypassing hwy. 1. Confine spill to workpad by building barriers with workpad materials. Block LWCs to keep oil on upstream side of pad. 2. Stop spill from crossing Dalton Hwy by blocking culverts. This step is extremely important when affected drainages are known. 3. If oil reaches or may reach active floodplain, deploy booms at drainage outlets to keep oil from entering Sag R. Three sites (CS2-5, CS2-6, and CS2-7) on Sag R, where oil could be contained during certain flow conditions, should be evaluated during reconnaissance. Ditching and berming along edge of floodplain to catch oil from small drainages or river bank may be used.	Summer Actions 1 through 3.	Summer Actions 1 through 3 , except use snow berms.	Summer Actions 1 through 3. During peak flow, all channels and floodplain may be inundated with water flowing at high velocities. Consider this when selecting containment sites to ensure personnel safety. Emphasize keeping oil from entering Sag R. Install culvert blocking and berms at all cross-drainages on Dalton Hwy and maintain them to ensure water passage while trapping oil.

(b) (7)(F), (b) (3)

SAGAVANIRKTOK RIVER 2

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK RIVER 2.5 (b) (7)(F), (b) (3)	1. Beaufort Sea (fish, waterfowl) 2. Sag R (fish, raptors, waterfowl) 3. Tundra, Marshes and Ponds (waterfowl)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3) flow east toward Sag R floodplain and can be contained before reaching Sag R by blocking hwy culverts. Because oil has to cross Dalton Hwy before reaching Sag R, hwy should be used as a primary containment structure by blocking cross-drainage structures.	Primary environmental objectives are: 1. Keep oil from reaching Sag R. 2. Keep oil from reaching Oks Crk. 3. Keep oil from reaching Beaufort Sea. Surface soils are highly erodible due to frozen silt to a depth greater than 15 ft on river terrace and to a depth of 6 ft on floodplain area from (b) (7)(F), (b) (3). Rolling hills are most sensitive area, where thermal erosion may occur if vegetative mat is disturbed. Fish and waterfowl are present in Sag R and in Oks Crk, which is perhaps one of most productive streams flowing into Sag R from west. Below pipeline crossing, fish are present from May through Sept. Most critical months for waterfowl are May and Sept when birds are migrating to and from breeding grounds.	(b) (7)(F), (b) (3)	Summer Actions 1 through 5. Flow in Oks Crk and small tr butaries could be low, and booms will not be required. Booms in Sag R may require maintenance to keep them ice-free.	Summer Actions 1 through 5, except use snow berms instead of booms.	Summer Actions 1 through 5. During peak flow, all channels and floodplain may be inundated with water flowing at high velocities. Consider this when selecting containment sites to ensure personnel safety. Emphasize keeping oil from flowing past Dalton Hwy and subsequently into Sag R. Install culvert blocking and berms at all cross-drainages on Dalton Hwy and maintain them to ensure water passage while trapping oil. It may be necessary to deploy a series of booms upstream of Oks Crk hwy culverts.

C-PLAN MAPS	12
AERIAL MAPS	51, 52
CONTAINMENT SITES	2-5, 2-6, 2-6A, 2-7, 2-8
(b) (7)(F), (b) (3)	

SAGAVANIRKTOK RIVER 3 CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Sagavanirktok R (fish, raptors) 2. Oksrukuyik (Oks) Crk (fish)	(b) (7)(F), (b) (3) [redacted] dary of this 14-mile-long contingency area. An oil spill in this area will flow toward the Sag R within numerous minor drainage courses. These drainage courses dissect the glacial till characteristic of this area. The Sag R flows north to the Beaufort Sea.	1. (b) (7)(F), (b) (3) [redacted] culvert can be blocked with an underflow structure. 2. Mobilize to the contingency area, and upon the reconnaissance teams' assessment of the spill, initiate containment actions for the affected pipeline segment.	Summer Actions 1 and 2. If oil enters flowing water under ice, it may be necessary to break the ice to facilitate containment. However, if oil is on top of the ice, the ice should not be broken.	Summer Action 2. Mobilize and proceed to the affected segment to implement containment actions at and near the leak source.	Summer Actions 1 and 2. Floating ice during this period may complicate containment actions. It may be necessary to concentrate containment activities at the source of the leak and at the point of entry into flowing water.

CONTAINMENT INSTRUCTIONS

The Sagavanirktok River 3 Contingency Area is divided into five segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

The primary objective in containing a spill is to prevent oil from reaching flowing water of the Sag R or its side channels and tributaries. However, if oil has reached the river from a leak in or adjacent to the river, the primary objective would be to contain the oil as close to the spill site as possible so that oil will not spread through the braided system of the Sag floodplain. At normal low flow during the ice-free season, containment and diversion of oil on the main river should be feasible. The best method would be to use one or two diversion booms in series to divert oil from a main channel to a secondary channel. The secondary channel should be one which contains standing or some flowing water which can be dammed with either overflow or underflow structures to facilitate oil recovery. It would be impractical to pinpoint containment sites in a changing floodplain; therefore, the Operations Section Chief, or his designee, will determine the best site after the spill is located.

During the winter months, the Sag R freezes to the bottom except in a number of areas where perennially flowing intragravel water surfaces. During the winter, a spill from the pipeline adjacent to the active floodplain may surface and be contained relatively close to the spill site, because most will be overland flow. If a leak develops in the pipe buried in the active floodplain gravel, oil may enter the intragravel water system below the Sag R channel. Any spill in such an area may not become visible until water and oil surface in aufeis fields.

During high flow periods (rain or breakup), effective containment of oil may be limited to the area where oil enters the river.

[redacted]

SAGAVANIRKTOK RIVER 3

CONTAINMENT INSTRUCTIONS FOR SAGAVANIRKTOK RIVER 3 SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK RIVER 3.1 (b) (7)(F), (b) (3) C-PLAN MAPS: 12, 13 AERIAL MAPS: 52 CONTAINMENT SITES: – (b) (7)(F), (b) (3): [redacted]	1. Sagavanirktok R (fish, raptors) 2. Oksrukuyik Crk (fish)	By air, by direct (b) (7)(F), (b) (3) [redacted] where pipeline right-of-way merges with hwy.	An oil spill within boundaries of PS03 should be contained within facility. Any spill not contained will flow northeast toward Sag R floodplain. If oil enters drainages, flow may reach Dalton Hwy and may be contained there by elevated road bed. An oil spill within segment will drain north and northeast toward Sag R. A spill may be contained by blocking drainage structures in AR 120-APS/AMS-3 and affected hwy CMPs if oil bypasses access road.	Primary environmental objective is to prevent oil from reaching Sag R. Soils here are highly erodible due to frozen silt to a depth of 4 ft. Relatively erosion-resistant frozen sand and gravel occur below 4 ft. Fish are present in Sag R.	1. (b) (7)(F), (b) (3) [redacted] to pipe by digging transverse ditches (sumps) across buried pipe. 5. If oil reaches Sag R, select appropriate containment site and use diversion booms to divert oil into abandoned channels. Employ blocking dams and underflow dams as necessary.	Summer Actions 1 through 5. Because ice jams often occur during freezeup, carefully select containment sites that are unobstructed by ice.	Summer Actions 1 through 4, except use snow berms. Aufeis accumulates in many locations on Sag R. Oil from a leak in buried pipe may accumulate in aufeis; trenches may be dug through ice to intercept oil.	Summer Actions 1 through 5. Due to bed-fast ice in river and ice accumulations beyond channels of river, concentrate containment activities at source of leak during breakup.
SAGAVANIRKTOK RIVER 3.2 (b) (7)(F), (b) (3) C-PLAN MAPS: 13 AERIAL MAPS: 52, 53, 54 CONTAINMENT SITES: – (b) (7)(F), (b) (3): [redacted]	1. Sagavanirktok R (fish, raptors) 2. Oksrukuy k Crk (fish)	By air, by direct access to workpad from PS03, and by direct access off Dalton Hwy.	(b) (7)(F), (b) (3) [redacted] buried in an old inactive floodplain of Sag R. Most oil from a spill will be trapped in old channel depressions and remain on west side of workpad and hwy. Any oil spilled and not contained at workpad or hwy will flow east toward floodplain of Sag R. Floodplain contains many abandoned meanders and abandoned river channels which may contain oil naturally. Oil may reach Sag R during breakup, particularly at south end of segment.	Primary environmental objective is to prevent oil from reaching Sag R. Soils here are highly erodible due to frozen silt to depth of 4 ft. Fish are present in Sag R drainage.	1. Confine spill on pad at source using materials found on workpad to build containment barriers. 2. Block drainage structures in pipeline and hwy downslope from spill. 3. Dig a series of transverse ditches (sumps) across buried pipeline at spill site to contain oil and to determine if oil is flowing underground parallel to pipeline. 4. If oil reaches Sag R, select containment sites where oil can be diverted from main channels into side channels and abandoned channels. Use multiple sets of diversion booms and berms with water bypass structures included.	Summer Actions 1 through 4. Because ice jams often occur at this time, select containment sites in river carefully to avoid areas of ice accumulations.	Summer Actions 1 through 3. Extensive areas of aufeis often exist in Sag R. Oil from a leak in buried pipe may accumulate in aufeis; transverse trenches may be dug to route oil away from river.	Summer Actions 1 through 4. Block CMPs at DHMP 3 (b) (7)(F), (b) (3) [redacted] backflow to east side of hwy during high water. Sag R channels are usually occupied by bed-fast ice; water from snow and ice melt changes course through stream frequently. Concentrate containment activities at source of leak and where oil enters flowing water.

CONTAINMENT INSTRUCTIONS FOR SAGAVANIRKTOK RIVER 3 SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK RIVER 3.3 (b) (7)(F), (b) (3) **C-PLAN MAPS** 13 **AERIAL MAPS** 52 through 59 **CONTAINMENT SITES** 2-8, 3-2, 3-3, 3-3A (b) (7)(F), (b) (3)	1. Sagavanirktok R (fish, raptors) 2. Oksrukuy k Crk (fish)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3) overland toward Oks Crk or northeast toward hwy. Oil that migrates beyond hwy will pool in depressions and small lakes and probably not reach Sag R. Drainage to Oks Crk is in numerous small, intermittent drainages that dissect glacial till. Some of these drainages cross workpad several times. Many small ponds in drainage depressions and small lakes may slow flow. In several sections of Oks Crk, stream bottom is braided. If oil reaches Oks Crk, use braided areas for containment by damming side channels and diverting oil to them with berms and booms. Oil may flow to a major intermittent drainage of Oks Crk which drains east to Sag R and crosses hwy.	Primary environmental objectives are: 1. Prevent oil from reaching Sag R. 2. Prevent oil from reaching Oks Crk. 3. Minimize aircraft disturbance during raptor nesting period (April 15 to Aug 31). Soil is highly erodible due to frozen silt to depths of 3 to 6 ft, with much of upland area consisting of silty sand and gravel to depths of over 15 ft with sporadic frozen silt in upper 10 ft. Massive ice intrusions occur at many locations just below organic layer. Fish are present in Sag R, while Oks Crk is important anadromous fish stream. Peregrine Falcon nesting occurs in Slope Mountain ZR. (b) (7) (F) nesting activities.	1 (b) (7)(F), (b) (3) 2 3 4 5 6	Summer Actions 1 through 6. Select containment sites on Sag R carefully because ice jams occur in river at this time.	Summer Actions 1, 2, and 4 through 6. Large accumulations of aufeis on Sag R may collect oil from leaks in buried pipe. Trenches may be dug through aufeis to route oil away from river.	Summer Actions1 through 6. During breakup, Sag R is often filled with bed-fast ice; runoff water often changes course from one channel to next. Containment may be difficult and should be concentrated at source of leak.
SAGAVANIRKTOK (b) (7)(F), (b) (3) **C-PLAN MAPS** 13 **AERIAL MAPS** 58, 59, 60 **CONTAINMENT SITES** 3-2, 3-3A, 3-4, 3-9 (b) (7)(F), (b) (3)	1. Sagavanirktok R (fish, raptors) 2. Oksrukuy k Crk (fish)	By air or on ground via pipeline workpad from Dalton Hwy by AR 119-APL-1.	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Prevent oil from reaching tr butary of Sag R. 2. Prevent oil from spreading through small lake fed by tributary of Sag R. 3. Prevent oil from reaching Sag R. 4. Prevent oil from reaching Oks Crk. 5. Minimize aircraft disturbance in Slope Mountain ZRA during raptor nesting period (April 15 to Aug 31). Soil is highly erodible due to frozen silt and silty sand and gravel. Disturbance or breaking of vegetative mat may result in thermal and hydraulic erosion because of slope. Limit vehicle traffic to ATVs and other low-ground-pressure vehicles in winter. Fish are present in Sag R, waterfowl might be present in small lakes about 3 miles downstream, and raptors are (b) (7)(F), (b) (3)	1 2 3 4 5	Summer Actions 1 through 4. Break surface of ice to help containment, if necessary. If oil is on ice, do not break ice. Maintain booms and keep ice-free.	Summer Actions 1 and 3, except use snow berms.	Summer Actions 1 through 5.

[redacted](
SAGAVANIRKTOK RIVER 3

CONTAINMENT INSTRUCTIONS FOR SAGAVANIRKTOK RIVER 3 SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SAGAVANIRKTOK RIVER 3.5 [redacted]	1. Sagavanirktok R (Fish, Raptors) 2. Oksrukuy k Crk (Fish)	By air or on ground via pipeline workpad from Dalton Hwy by taking AR 119-APL-1 and AR 118-APL-1 to pipeline intersection. Oks Crk [redacted] blocks vehicle traffic. Specific access along the length of Oks Crk is by helicopter during summer and ATVs during winter.	[redacted]	Primary environmental objectives are: 1. Keep oil from reaching Oks Crk or tributary of Oks Crk. 2. Prevent oil in Oks Crk or its tributary from reaching Sag R. Soil is highly erodible due to frozen silt and silty sand and gravel. Disturbance or breaking of vegetative mat would result in thermal and hydraulic erosion because of slope. Fish are present in Sag R. Oks Crk is important anadromous fish stream. Aufeis is present in winter in Oks Crk. Raptors are present along bluffs east [redacted]	[redacted]	Summer Actions 1 through 3. Break surface of ice if necessary for containment. If oil is on surface of ice, do not break ice. Maintain booms and keep ice-free.	Summer Actions 1 and 2 , except use snow berms	Summer Actions 1 through 3.

C-PLAN MAPS	13
AERIAL MAPS	59, 60, 61
CONTAINMENT SITES	2-8, 3-2, 3-3A, 3-4, 3-9

[redacted]

(b) (7)(F), (b) (3)

TOOLIK/KUPARUK RIVERS CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Kuparuk R (fish) 2. Toolik R (fish)	(b) (7)(F), (b) (3)	1. If oil has entered or threatens to enter the Toolik R, an IRT will go by helicopter to CS3-8 on the Toolik R or to the junction of EF Kuparuk R and Kuparuk R. Depending on reconnaissance assessment of the spill location and movement of oil, containment sites closer to the spill might be selected for initial action. If the spill appears as if it will reach CS3-8, deploy booms to divert oil to the side channels of abandoned meanders or oxbow lakes of the braided stream system. It may be necessary to excavate the entrance to some of these containment sites. Containment sites will be at the upper end of the braided area to facilitate catching oil before it spreads to all channels. 2. A second IRT will proceed to the contingency area and implement containment actions at and near the leak source.	Summer Actions 1 and 2. It may be necessary to break the surface of the ice to facilitate containment. If oil is only on the surface of the ice, do not break the ice. Booms should be maintained and kept ice-free.	Summer Action 2.	Summer Actions 1 and 2 with modifications. Aufeis may be present in the braided reaches of both the Kuparuk and Toolik R and may impair containment efforts. Oil flowing beneath the aufeis may be contained by digging a trench through the aufeis downslope of the leading edge of the spill and lining the downslope side with Visqueen to force oil to the surface. Remove oil immediately to prevent any subsurface backponding. High flow velocities and ice may make containment difficult.

CONTAINMENT INSTRUCTIONS

The Toolik/Kuparuk River Contingency Area is divided into seven segments. Specific containment instructions are provided for this segment; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TOOLIK/KUPARUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
TOOLIK/KUPARUK RIVERS 1 (b) (7)(F), (b) (3) (b) (7)(F), (b) (3)	1. Kuparuk R (fish) 2. Toolik R (fish) **C-PLAN MAPS** 13 **AERIAL MAPS** 60, 61 3-5, 3-6, 3-7, 3-8,	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching tributary of Toolik R. 2. Keep oil, if in tributary, from reaching Toolik R. 3. Keep oil from reaching Oks Crk. Soil is erodible due to frozen silt and frozen silty sand and gravel with high ice content. Massive ice underlies some soil; area is highly susceptible to thermal erosion. Disturbance of vegetative mat could result in settling and subsidence in level areas with hydraulic erosion on either side of pipeline. Fish are present in Tool k R and Oks Crk.	(b) (7)(F), (b) (3)	Summer Actions 1 through 6. If headwater drainages are dry, follow Summer Actions 1 and 2.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 and 2. Actions 3 and 5 may have to be modified due to high flow, velocities, and floating ice, which make containment extremely difficult. Emphasize containing oil before it reaches flowing water.
TOOLIK/KUPARUK (b) (7)(F), (b) (3) (b) (7)(F), (b) (3)	1. Kuparuk R (fish) olik R (fish) **C-PLAN MAPS** 13 **AERIAL MAPS** 62, 63 **CONTAINMENT SITES** 3-5, 3-7, 3-9	By helicopter in all seasons and by ATV from Dalton Hwy in winter. No access roads or pipeline workpad in segment.	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching Oks Crk. 2. Keep oil from reaching tributary of Toolik R. 3. Keep oil from reaching Toolik R. Soil is highly erodible due to frozen silty sand and gravel with ice and sporadic frozen silt. Fish are present in Oks Crk and in Tool k R.		Summer Actions 1 through 3. Break surface of ice if necessary for containment. If oil is only on ice surface, do not break ice.	Summer Action 1, except use snow berms.	Summer Actions 1 through 3. Actions 2 and 3 may have to be modified, as high flow, velocities, and floating ice may make containment difficult. Emphasize containing oil before it enters flowing water.

(b) (7)(F), (b) (3)

TOOLIK/KUPARUK RIVERS

CONTAINMENT INSTRUCTIONS FOR TOOLIK/KUPARUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
TOOLIK/KUPARUK (b) (7)(F), (b) (3) C-PLAN MAPS: 13 AERIAL MAPS: 62, 63, 64 CONTAINMENT SITES: 3-5, 3-6, 3-7, 3-8 (b) (7)(F), (b) (3)	1. Kuparuk R (fish) Toolik R (fish)	By helicopter in all seasons and by ATV from Dalton Hwy in winter. No access roads or pipeline workpad in segment.	Oil will flow north up to 2,000 ft toward tributary of Toolik R or another stream of upper watershed of major tributary of Toolik R. Tributary flows northeast to Toolik R. Several small lakes in drainage may be affected.	(b) (7)(F), (b) (3) Fish are present in Toolik R.	First objective is to keep oil from reaching tributaries to Toolik R or Upper Toolik R. 1. Contain oil in natural depressions and gullies, and stop overland flow of oil along pipeline using barriers and sorbents. 2. Install underflow dams in tributary of Toolik R at CS3-5 or CS3-7, as appropriate. Use sorbent fences for containment. 3. If spill reaches or likely will reach main Toolik R, deploy multiple booms and sorbent fences to contain oil.	Summer Actions 1 through 3. If necessary, break surface of ice to allow containment. If oil is on ice surface, do not break ice.	Summer Action 1, except use snow berms.	Summer Actions 1 through 3. Actions 2 and 3 may be modified, as high flow, velocities, and floating ice may make containment difficult. Emphasize containing oil before it enters flowing water.
TOOLIK/KUPARUK (b) (7)(F), (b) (3) C-PLAN MAPS: 13 AERIAL MAPS: 63, 64 (b) (7)(F), (b) (3)	1. Kuparuk R (fish) Toolik R (fish)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3) Primary environmental objectives are: 1. Keep oil from reaching Toolik R. 2. Minimize area affected downstream of spill. Soil is highly erodible due to frozen silty sand and gravel with sporadic frozen silt. Fish are present in Toolik R.	First objective is to keep oil from reaching Toolik R. If oil enters this watercourse, objective is to contain oil in Toolik R at CS3-8. 1. Confine spill to workpad by building berms with materials from workpad. Use barriers and sorbents to confine oil to depressions and drainage channels near pipeline. 2. If oil reaches Toolik R, install underflow dam downstream from leading edge of spill. 3. If necessary, use helicopter to reach CS3-8. Deploy multiple booms and sorbent fences to contain oil.	Summer Actions 1 through 3. If no flow in Upper Tool k R, emphasize Action 1.	Summer Action 1, except use snow berms.	Summer Actions 1 through 3. Actions 2 and 3 may be modified, as high flow, velocities, and ice may make containment extremely difficult. Emphasize keeping flow from reaching flowing water. If aufeis at CS3-8, contain oil upstream of aufeis field.

(b) (7)(F), (b) (3)

TOOLIK/KUPARUK RIVERS

CONTAINMENT INSTRUCTIONS FOR TOOLIK/KUPARUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
TOOLIK/KUPARUK (b) (7)(F), (b) (3)	1. Kuparuk R (fish) 2. Toolik R (fish) C-PLAN MAPS: 13, 14 AERIAL MAPS: 64 CONTAINMENT SITES: 3-11 (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Pipeline is elevated throughout segment. Oil will flow up to 3,000 ft t F 1 d K (b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching EF Kuparuk R. 2. Keep oil from reaching Kuparuk R. Soil is highly erodible due to frozen silt and frozen silty sand and gravel with relatively steep slopes along tributary streams. Fish are present in EF Kuparuk R and in Kuparuk R.	First objective is to keep oil from reaching EF Kuparuk R. If oil enters this watercourse, objective is to keep oil from entering Kuparuk R. 1. Confine spill on workpad at source using materials from workpad. 2. Install barriers downslope from leading edge of spill to keep oil from entering EF Kuparuk R. Use sorbents for containment. 3. If oil enters EF Kuparuk R, use a helicopter to deploy a boom across small lake to keep oil in lake (CS3-11). If spill is small, deploy boom across inlet of lake. If spill is large, place boom at both inlet and outlet of lake. Use sorbents for containment. 4. If oil enters or will enter Kuparuk R, build underflow dam in EF Kuparuk R up from confluence with Kuparuk R. During high flow or if oil reaches Kuparuk R, deploy diversion booms in braided reach of river and divert oil to side channels or abandoned meander channels. Use sorbents for containment.	Summer Actions 1 through 4. If EF Kuparuk R is dry, emphasize Actions 1 and 2. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice. Maintain booms and keep ice-free.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 4. Actions 3 and 4 may need to be modified, as high flow, velocities, and floating ice may make containment difficult. Emphasize containing spill before it reaches flowing water. In aufeis areas, oil could be trapped or flow under aufeis. Contain oil under aufeis where it surfaces naturally, or if necessary, dig a trench through the aufeis downslope of leading edge of spill. Line downslope side of trench with impermeable material to force oil to surface, and remove oil as soon as possible to prevent subsurface backponding.
TOOLIK/KUPARUK RIVERS 6 (b) (7)(F), (b) (3)	1. Kuparuk R (fish) 2. Toolik R (fish) C-PLAN MAPS: 14 AERIAL MAPS: 64 through 67 CONTAINMENT SITES: 3-12, 3-13, 3-14, 3-15, 3-15A, 3-16 (b) (7)(F), (b) (3) (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching Becky Crk or Holt Crk. 2. Keep oil from reaching Kuparuk R directly or through tributary. Soil is highly erodible due to frozen silt and frozen silty sand and gravel with relatively steep slopes. Fish are present in Kuparuk R, Becky Crk, and Holt Crk.	(b) (7)(F), (b) (3)	ummer Actions 1 rough 7. necessary, break rface of ice to allow ntainment. If oil is nly on ice surface, do ot break ice.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 7. Actions 5 and 6 may be modified, as high flow, velocities, and floating ice may make containment difficult. Emphasize containing spill before it reaches flowing water. In aufeis areas, oil could be trapped or flow under aufeis. Contain oil flowing under aufeis where it surfaces naturally, or if necessary, dig a trench through aufeis downslope of leading edge of spill. Line downslope side of trench with membranes to force oil to surface. Remove oil as soon as possible to prevent subsurface backponding.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TOOLIK/KUPARUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
TOOLIK/KUPARUK (b) (7)(F), (b) (3)	1. Kuparuk R (fish) oolik R (fish)	By air or on ground via pipeline workpad from Dalton Hwy using AR 116-APL-1 or AR 115-APL-3.	Oil will flow west toward and into many intermittent drainages, crossing hwy through culverts. Drainages dissect glacial till and feed many lakes including Toolik Lk. Area is upper watershed for major tributary of Kuparuk R. In much of segment, except during high flow, oil will probably pool in natural depressions. Oil passing through culverts and entering lakes could flow downstream into Kuparuk R.	Primary environmental objectives are: 1. Keep oil from reaching main tributaries to Toolik Lk. 2. Keep oil from reaching Toolik Lk. Soil is moderately to highly erod ble due to frozen silty sand and gravel with sporadic frozen silt. Fish are present in Toolik Lk, several tributaries feeding lake (Ed Crk, Mack Crk, Terry Crk, and Moss Crk), and Kuparuk R. Waterfowl may be found in limited numbers.	First objective is to keep oil from reaching any of tributary streams of Toolik Lk by blocking appropriate highway culverts. If oil enters these streams, objective is to keep oil from reaching Toolik Lk. Highway is downslope of pipeline throughout this segment and will be used as primary containment area for a spill. 1. Confine spill on workpad using materials from workpad. 2. Install barriers downslope of leading edge of spill. 3. Stop spill from crossing hwy or AR 116-APL-1 by blocking culverts downslope from spill. 4. Use helicopter and deploy boom across inlet of Toolik Lake (CS3-18). If oil has entered lake, also deploy boom across outlet (CS3-19).	Summer Actions 1 through 4. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice. Maintain booms and keep ice-free.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 4.

C-PLAN MAPS	14
AERIALS	67, 68, 69
CONTAINMENT SITES	3-17, 3-18, 3-19

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

ITKILLIK RIVER

ITKILLIK RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Itkillik R (fish)	(b) (7)(F), (b) (3)	1. If oil has entered or threatens to enter Jill Crk, an IRT will go by helicopter to CS3-20 on Jill Crk, a tributary to Itkillik R. Deploy a boom across the outlet of the first lake along Jill Crk, downslope of the spill. If oil has bypassed the first lake, proceed to the second larger lake (CS3-21) and deploy booms across the outlet of the lake. If oil has not entered these lakes, deploy booms at the inlet. 2. An IRT will move to the contingency area and implement containment actions at and near the leak source. Block highway culverts downslope from the spill.	Summer Actions 1 and 2.	Summer Action 2. Snow berms will be used.	Summer Actions 1 and 2.

CONTAINMENT INSTRUCTIONS

The Itkillik River Contingency Area contains one segment. Specific containment instructions are provided for this segment; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

ITKILLIK RIVER

CONTAINMENT INSTRUCTIONS FOR ITKILLIK RIVER SEGMENT

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
ITKILLIK RIVER 1 (b) (7)(F), (b) (3) **C-PLAN MAPS** 14 **AERIAL MAPS** 69, 70 **CONTAINMENT SITES** 3-20, 3-21 (b) (7)(F), (b) (3)	1.Itkillik R (fish)	By air and via Dalton Hwy to AR 115-APL-3 or AR 115-APL-1.	Oil will flow across hwy through culverts toward and into Jill Crk, which feeds two small lakes. Lakes are headwaters for major tr butary of Itkill k R. Contain oil ts (b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching Jill Crk. 2. Keep oil from passing Dalton Hwy. 3. Keep oil from passing lakes on Jill Crk. Soil is highly erod ble due to frozen silt to depths of 6 ft with frozen silty sand and gravel to 16 ft. (b) (7)(F), (b) (3)	First objective is to keep oil from reaching Jill Crk, a tributary to Itkillik R. If oil enters this watercourse, objective is to contain oil in the watercourse at highway by blocking appropriate highway culverts or contain a spill in one of two lakes downstream at CS3-20 or CS3-21. 1. Confine spill to workpad by building berms with materials from workpad. Install barriers downslope from leading edge of spill. 2. If oil enters Jill Crk but does not cross hwy, use underflow dams to block four culverts in hwy between [redacted] 3. Deploy booms at CS3-20 or CS3-21. Use sorbent fences and booms for containment. If oil does not enter lakes, deploy boom at inlets.	Summer Actions 1 through 3. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice. Maintain booms and keep ice-free.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 3. Ice on lakes (CS3-20 and 3-21) may hinder use of booms; if necessary, block outlets of lakes with underflow dams.

(b) (7)(F), (b) (3)

GALBRAITH LAKE

GALBRAITH LAKE CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Galbraith Lake (fish) 2. Atigun R (fish, raptors)	(b) (7)(F), (b) (3)	1. If initial assessment indicates that oil is likely to enter Ga braith Lake, an IRT will deploy boom at CS3-24 located at the north inlet of Ga braith Lake. If oil has reached the lake, an additional boom will be deployed at CS3-22 located at Galbraith Lake outlet. If oil is entering the lake along its east shore, an IRT will deploy booms parallel to the shore to keep oil from spreading throughout the lake. A boat and motor will be required for boom deployment. 2. An IRT will proceed to the spill site and initiate containment actions at the source of the spill. 3. If oil has entered the Atigun R, an IRT will proceed to CS3-29 at the Dalton Hwy crossing of the Atigun R (b) (7)(F),) and deploy a series of diversion booms across the river.	Summer Actions 1 through 3.	Summer Action 2. It is unlikely that oil will reach Galbraith Lake from any spill during the winter months. There are no known icing or open-water sites in this area during this period.	Summer Actions 1 through 3. Summer Action 3 may have to be modified because high flow, velocities, and floating ice may make containment in the Atigun R impractical.

CONTAINMENT INSTRUCTIONS

The Galbraith Lake Contingency Area is divided into four segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

GALBRAITH LAKE

CONTAINMENT INSTRUCTIONS FOR GALBRAITH LAKE SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) C-PLAN MAPS: 14, 15 AERIAL MAPS: 69, 70, 71 CONTAINMENT SITES: 3-22, 3-24, 3-25, 3-26 (b) (7)(F), (b) (3)	1. Galbraith Lk (fish) . Atigun R (fish, raptors)	By air or by ground via pipeline workpad from Dalton Hwy using AR 115-APL-3.	Spill would flow west toward Island Lk. Dalton Hwy is between elevated section of pipeline and Island Lk.	Primary environmental objectives are: 1. Keep oil from reaching Island Lk and tributaries of Galbraith Lk. 2. Keep oil from reaching Galbraith Lk. Soil is highly erodible because of frozen silt to depths of 6 ft. Fish are present in Galbraith Lk and northern inlet stream which crosses AR 114-APL/AMS-5. Some waterfowl may use lake during migration, but lake not good nesting habitat. Fish are present in Island Lk. Sheep may be present on mountain slope east of pipeline; do not disturb them with aircraft during reconnaissance and containment operations.	**Note:** It is critical that hwy culverts be plugged as soon as possible. (b) (7)(F), (b) (3)	Summer Actions 1 through 5.	Summer Actions 1 and 2. If oil reaches frozen surface of Island Lk, contain it with snow berms.	Summer Actions 1 through 5. During high runoff, deploy boom at Ga braith Lk inlet (CS3-24) if necessary due to rapid oil flow, and at Galbraith Lk outlet (CS3-22), if oil reaches Ga braith Lk.
GALBRAITH LAKE 2 (b) (7)(F), (b) (3) C-PLAN MAPS: 15 AERIAL MAPS: 69 through 72 CONTAINMENT SITES: 3-22, 3-24, 3-27 (b) (7)(F), (b) (3)	1. Galbraith Lk (fish) 2. Atigun R (fish, raptors)	By air or on ground via pipeline workpad from Dalton Hwy using AR 115-APL-1 or 114-APL/AMS-5.	Spill from elevated pipe will flow west toward tributary of Galbraith Lk. Oil will first reach hwy. Oil that bypasses hwy via culverts will flow southwest towards AR 114-APL/AMS-5. Oil will also flow along east shoulder of hwy and through culvert in AR 114-APL/AMS-5. Contain oil at hwy and AR.	Primary environmental objectives are: 1. Keep oil from reaching main tr butary of Ga braith Lk. 2. Keep oil from reaching Galbraith Lk. Soil adjacent to pipeline is highly erodible because of frozen silt to depths of 6 ft. Fish are present in Galbraith Lk and its inlet stream which crosses AR 114-APL/AMS-5. Some waterfowl may use lake during migration, but it is not good nesting habitat. Sheep may be present on mountain slope east of pipeline; do not disturb them with aircraft during reconnaissance and containment operations.		Summer Actions 1 through 3, with emphasis on Actions 1 and 2, since drainages will be dry.	Summer Actions 1 and 2, except use snow berms.	Summer Actions 1 through 3. Action 3 will likely be necessary if surface-water runoff is high. If oil reaches Galbraith Lk, deploy booms at Galbraith Lk outlet (CS3-22).

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR GALBRAITH LAKE SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
GALBRAITH LAKE (b) (7)(F), (b) (3) **C-PLAN MAPS** 15 **AERIAL MAPS** 71, 72 **CONTAINMENT SITES** 3-22, 3-24, 3-27 (b) (7)(F), (b) (3)	1. Galbraith Lk (fish) 2. Atigun R (fish, raptors)	By air or on ground via pipeline workpad from Dalton Hwy using AR 114-APL-5 and 114-APL-3. Access to east shore of Galbraith Lk is by helicopter during all seasons. Deployment of booms along shore may require use of boat and motor.	Oil will flow west through several intermittent drainages to Ga braith Lk. Number of drainages affected will depend on how hwy CMPs affect flow. Oil may be restricted to one or several drainages entering lake by culverts in hwy. During high runoff, some oil may reach lakes west of hwy.	Primary environmental objectives are: 1. Keep oil from reaching Ga braith Lk. 2. Keep oil from reaching Atigun R. Soil adjacent to aboveground pipeline is highly erodible because of frozen silt to depths of 6 ft. In more level areas away from pipeline, such as CS3-27, frozen silt with considerable ice is found to depths of 15 ft. Fish are present in Galbraith Lk and its inlet and outlet streams. Some waterfowl may use lake during migration, but it is not good nesting habitat. Sheep may be present on mountain slope east of pipeline; do not disturb them with aircraft during reconnaissance and containment operations.	**Note:** It is critical that hwy culverts be plugged when spill is located. 1. Use material from workpad and material sites to confine spill to workpad or adjacent to workpad. 2. Block hwy culverts downslope from spill. If necessary, provide underflow structures. 3. Deploy booms on east side of Galbraith Lk at outlets of affected drainages. 4. If oil reaches small ponds north of Galbraith Lk, deploy boom at outlet of larger pond (CS3-27). 5. Deploy boom at inlet of lake (CS3-24) if oil reaches or may reach main tributary to Ga braith Lk. If oil reaches and spreads over Ga braith Lk, deploy boom at outlet of lake (CS3-22).	Summer Actions 1 through 3, as some drainages may be dry.	Summer Actions 1 through 3, except use snow berms.	Summer Actions 1 through 5.
GALBRAITH LAKE (b) (7)(F), (b) (3) **C-PLAN MAPS** 15, 16 **AERIAL MAPS** 72, 73 **CONTAINMENT SITES** 3-22, 3-28, 3-29 (b) (7)(F), (b) (3)	1. Galbraith Lk (fish) Atigun R (fish, raptors)	By air or by ground via pipeline workpad using AR 114-APL-3.	Oil will flow west and may reach small lakes west of hwy. Small lakes drain into outlet of Galbraith Lk. Galbraith Lk drains into Atigun R. Oil would first reach Dalton Hwy; contain oil at hwy by plugging culverts.	Primary environmental objectives are: 1. Keep oil from reaching Ga braith Lk. 2. Keep oil from reaching Atigun R. Soil is highly erod ble because of frozen silt to depths of 6 ft. Fish are present in Galbraith Lk and its outlet stream. Some waterfowl may use lake during migration, but it is not good nesting habitat. Sheep may be present on mountain slope east of pipeline; do not disturb them with aircraft during reconnaissance and containment operations.	**Note:** It is critical that hwy culverts be plugged when spill is located. 1. Use material from workpad to confine spill to workpad. 2. Block hwy culverts downslope from spill. If necessary, provide underflow structures. 3. If oil reaches west shore of Galbraith Lk just north of outlet, deploy boom to contain oil along shoreline. 4. If oil reaches ponds between hwy and Ga braith Lk, deploy boom at CS3-28. 5. If oil enters or may enter Galbraith Lk, deploy boom at CS3-22. 6. If oil passes CS3-22, go to CS3-29 and deploy diversion booms to divert oil into abandoned channels to excavated diversion pits.	Summer Actions 1 through 5.	Summer Actions 1 through 4, except use snow berms.	Summer Actions 1 through 6. Action 6 may be modified, as high velocities and ice may make containment in Atigun R impractical.

(b) (7)(F), (b) (3)
[redacted]

GALBRAITH LAKE

(b) (7)(F), (b) (3)

ATIGUN RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Sagavanirktok R (fish, raptors) 2. Atigun R (fish, raptors)	(b) (7)(F), (b) (3)	1. If oil is present or if reconnaissance has determined it will enter the Atigun R, deploy a series of diversion booms at CS3-29 to divert oil to the south bank. During high water, it may be necessary to boom the outlet of Galbraith Lake to keep oil from backing up into the lake from the Atigun R. If a leak occurs at the Atigun crossing, deploy a diversion boom downstream from the pipeline bridge to intercept and divert oil which has not already moved down river. It may be necessary to use containment pits in conjunction with diversion booming. 2. If oil has passed the Atigun Bridge, go by helicopter directly to CS3-23 at the confluence of the Atigun R and Sag R. Deploy a series of diversion booms across slack water or pool areas, diverting oil to side channels and depressions along the edge of the river. Some oil may be emulsified when it reaches this point. 3. Initiate containment actions at or near the source of the leak.	Summer Actions 1 through 3. It may be necessary to use debris deflectors to prevent floating ice from interfering with booms.	Summer Actions 1 through 3, except that snow berms may be used for containment. Due to aufeis, trenches may be required to intercept oil.	Summer Actions 1 through 3. Anticipate high volumes of water and ice that may cause containment within the Atigun R to be extremely difficult. Containment activities will be concentrated at the source of the spill and at the location where oil enters flowing water.

CONTAINMENT INSTRUCTIONS

The Atigun River Contingency Area is divided into four segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

ATIGUN RIVER

CONTAINMENT INSTRUCTIONS FOR ATIGUN RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
ATIGUN RIVER 1 (b) (7)(F), (b) (3) C-PLAN MAPS: 16 AERIAL MAPS: 72, 73, 74 (b) (7)(F), (b) (3)	1. Sag R (fish, raptors) tigun R (fish, aptors)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil from reaching Atigun R. 2. Keep oil from reaching Sag R. 3. Keep oil from reaching Tee Lk. Soil is highly erodible due to frozen silt from 5 to over 15 ft deep with extensive ice in many areas. Fish are present in Atigun R, Tee Lk outlet, and several small lakes in Atigun Valley. Several small lakes near PS04 contain arctic grayling and whitefish. Tee Lk has burbot and lake trout. Sheep may be present on mountain slopes of Atigun Valley; minimize disturbance by aircraft during reconnaissance, containment, and cleanup operations. Atigun Gorge is a sheep lambing area; populations move across Atigun R regularly. Low-level air traffic related to spill that reaches gorge could disturb sheep. Raptors are present high on mountains along Atigun R.	(b) (7)(F), (b) (3) immediately north of road crossing and include underflow structure. 8. If oil reaches Atigun R, deploy diversion booms, depending on discharge and velocity, at CS3-29 to keep oil out of stream and from flowing toward Sag R.	Summer Actions 1 through 8.	Summer Actions 1 through 3, except use snow berms. If oil reaches aufeis area of Atigun R, build trenches as necessary to channel oil away from river or intercept oil that reaches river.	Summer Actions 1 through 8. Due to volumes of water and ice in Atigun R at this time, containment in river may be difficult. Concentrate containment activities at spill source and where oil enters flowing water.
(b) (7)(F), (b) (3) C-PLAN MAPS: 16, 17 AERIAL MAPS: 74 CONTAINMENT SITES: 3-29, 3-30, 3-31 (b) (7)(F), (b) (3)	Sag R (fish, raptors) Atigun R (fish, raptors)	Segment is in and adjacent to PS04; accessible from Dalton Hwy via AR 114-APL-2.	Contain spills that occur in confines of PS04 within facility. Any oil not confined will flow west toward several lakes near pipeline. Two small streams connect ponds and flow north and northwest toward Atigun R. Most oil should be retained in depressions and ponds and I kely will not reach Atigun R.	Primary environmental objective is to keep oil from reaching Atigun R. Soil is highly erodible due to frozen silt to depths of 2 ft with frozen silty sand and gravel to 6 ft. Soils between Atigun R and PS04 are more sensitive, with deeper silt and higher ice content than on hill around pump station. Fish are present in Atigun R. Presence of fish in small lakes that might be affected is unknown, but because of the lakes' size, fish are unlikely. Raptor and sheep habitat occurs in mountains adjacent to PS04; minimize disturbance by aircraft during reconnaissance, containment, and cleanup operations.	Objective is to keep oil from reaching Atigun R, its tributaries, and lakes in this vicinity. 1. Confine spill to workpad by building berms and barriers with materials from pump station pad. 2. Build berms or barriers in front of leading edge of spill to keep oil from reaching flowing water. 3. If oil reaches ponds west of pump station, deploy booms to contain oil in ponds. Build underflow dam at CS3-31 to keep oil from reaching Atigun R. If necessary, build containment channel or sump on floodplain between pond outlets and Atigun R. 4. If oil reaches Atigun R, deploy diversion booms at CS3-29 downstream from Dalton Hwy Bridge to divert oil to south bank.	Summer Actions 1 through 4.	Summer Actions 1 and 2, except use snow berms. If oil reaches aufeis area on Atigun R, build trenches through ice as necessary to channel oil away from river or to intercept oil that enters river.	Summer Actions 1 through 4. Due to volumes of water and ice in Atigun R, containment in river may be extremely difficult. Concentrate containment activities at spill source and where oil enters flowing water

(b) (7)(F), (b) (3)

ATIGUN RIVER

CONTAINMENT INSTRUCTIONS FOR ATIGUN RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) C-PLAN MAPS: 17, 18 AERIAL MAPS: 74, 80 CONTAINMENT SITES: 3-29, 3-32 (b) (7)(F), (b) (3)	1. Sag R (fish, raptors) Atigun R (fish, raptors)	By air, via pipeline workpad directly from PS04, and from Dalton Hwy by taking the following access (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil out of Atigun R tributaries. 2. Keep oil out of Atigun R. 3. Keep oil out of Sag R. Soil varies from being highly erodible with frozen silt to depths of 15 ft and extensive ice, to erosion-resistant sand and gravel of main river and side channels. Take extreme care in determining access routes. Fish are present in Atigun R and several small lakes in Atigun Valley. Fish have been observed in side streams as far south (b) (7)(F), (b) (3) There may be sheep on mountain slopes on either side of Atigun Valley; minimize disturbance by aircraft during reconnaissance, containment, and cleanup. Raptors also are present high on mountains along river.	1. Confine spill on workpad using materials from workpad. If no workpad, use materials found on active floodplain to build berms and dams to confine spill to pipeline right-of-way. Block drainage structures downslope from spill. 2. Build berms or barriers to keep oil from reaching flowing water. 3. (b) (7)(F), (b) (3) 111-APL/AMS-3. 6. If oil enters Atigun R, select containment sites and use diversion berms and booms to divert oil into side channels and abandoned channels on east side of river. Build underflow dams to use side channels for containment. 7. If oil flows downstream in Atigun R, deploy diversion booms at CS3-29 to divert oil to south bank or at CS3-32, using oxbow on east side of river for storage.	Summer Actions 1 through 7.	Summer Actions 1 through 3, except use snow berms. If oil enters aufeis area, excavate trenches through ice as necessary to channel oil away from river or to intercept oil that reaches river.	Summer Actions 1 through 7. Due to volumes of water and ice, containment in Atigun R may be extremely difficult. Concentrate containment activities at spill source and where oil enters flowing water.
(b) (7)(F), (b) (3) C-PLAN MAPS: 17, 18 AERIAL MAPS: 80 through 84 CONTAINMENT SITES: 3-33, 3-34 (b) (7)(F), (b) (3)	1. Sag R (fish, raptors) Atigun R (fish, raptors)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil out of Atigun R. 2. Keep oil out of Sag R. Soil varies from highly erodible frozen silty sand and gravel with ice to relatively erosion-resistant floodplain gravels. Fish are present in Atigun R, and raptors use river canyon.	1. Confine spill to workpad using materials from workpad. If no workpad, use materials found on active floodplain to build berms and dams to confine spill to pipeline right-of-way. Block drainage structures on workpad to keep oil on uphill side of workpad. 2. If oil seepage found along pipeline, dig transverse ditches (sumps) across pipeline to level below pipe or to water table; line with impermeable material to keep oil out of Atigun R. 3. If oil reaches main channels of river, divert to side channels using diversion berms and booms. Confine oil to side channels using berms. Build underflow dam at CS3-33 (Dalton Hwy Bridge) if flows permit or deploy diversion booms to divert oil from main channel. 4. If oil flows beyond hwy bridge (b) (7)(F), (b) (3) 5 (b) (7)(F), (b) (3)	Summer Actions 1 through 5.	Summer Actions 1 through 5, except use snow berms. (b) (7)(F), (b) (3)	Summer Actions 1 through 5. Containment in Atigun R will be extremely difficult due to large volumes of water and ice. Concentrate containment activities at side channels where water velocities are sufficiently slow.

(b) (7)(F), (b) (3)

ATIGUN RIVER

(b) (7)(F), (b) (3)

NORTH FORK CHANDALAR RIVER

NORTH FORK CHANDALAR RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. North Fork Chandalar R (fish)	The North Fork Chandalar River Contingency Area is located in the Brooks Range. The north boundary, which is the Continental Divide, lies approx. 150 air miles south of Prudhoe Bay, while the south boundary is approx. 225 air (b) (7)(F), (b) (3) The pipeline closely follows the West Fork of NF Chandalar R throughout most of this area. Consequently, oil from a spill would either flow directly into the river or flow for only short distances overland or through tributaries before reaching the river.	(b) (7)(F), (b) (3) areas. If the spill has passed CS4-1, move to a location downstream from the leading edge of the spill or to CS4-2, located approx. 35 miles downstream from the pipeline, and initiate containment actions. Deploy diversion booms to divert oil into side channels or oxbow lakes to prevent oil from flowing into Chandalar Lake. 2. Move to the contingency area and implement containment actions at and near the leak source, and at the point of oil entry into flowing water.	Summer Actions 1 and 2. If the flow of water in the West Fork of the NF Chandalar River or its tr butaries is low and ice is beginning to form in the river, Action 1 can be implemented farther upstream from CS4-1, at a location sufficiently downstream from the leak source so that the containment procedures can be implemented prior to the leading edge of oil reaching the location.	Summer Actions 1 and 2, except use snow berm. If oil enters aufeis area, excavate trenches through ice as necessary to channel oil away from river or to intercept oil that reaches river.	Containment actions during this time will depend on site-specific water, snow, and ice conditions. 1. If the West Fork of the NF Chandalar R and its tributaries are mostly covered with ice, and water is beginning to flow over, under, or adjacent to the ice, initiate Summer Actions 1 and 2. 2. If the streams are flowing at a high discharge with ice and debris, and the velocities are above 3 fps, use Summer Action 2. Emphasis should be directed towards keeping the oil from entering the flowing water where containment will be extremely difficult. 3. If there is little or no floating ice and debris, and the velocities are about 3 fps or less, use Summer Actions 1 and 2.

CONTAINMENT INSTRUCTIONS

The North Fork Chandalar River Contingency Area is composed of one segment. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

[redacted]

NORTH FORK CHANDALAR RIVER

CONTAINMENT INSTRUCTIONS FOR NORTH FORK CHANDALAR RIVER SEGMENT

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
NORTH FORK CHANDALAR (b) (7)(F), (b) (3)	1. North Fork Chandalar R (fish)	By air. Approx. 3.5 miles of pipeline are buried in active floodplain of West Fork of NF Chandalar R; these portions have no associated workpad. Ground access along pipeline for surveillance or containment will be by 4-WD (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objectives are: 1. Keep oil out of West Fork of NF Chandalar R. 2. Keep oil that enters West Fork of NF Chandalar R out of NF Chandalar R. (b) (7)(F), (b) (3)	Objective is to keep oil from entering West Fork of NF Chandalar R. Because pipeline is either in floodplain or immediately adjacent to it in most of area, it may not be possible to do so. Thus, if oil has entered West Fork of NF Chandalar R, objective is to keep it from reaching NF Chandalar R. If oil enters West Fork of NF Chandalar R during low and normal flow, it can be blocked using suitable water bypass systems. 1 (b) (7)(F), (b) (3) 2 3 4 5	Summer Actions 1 through 5. If necessary, break ice to allow containment; if oil is on top of ice, do not break ice. If no flow in West Fork of NF Chandalar R, emphasize Actions 1 through 4.	Summer Actions 1 through 4 , except use snow berms.	Summer Actions 1 through 5. Action 5 may be modified to suit conditions. Water velocities >3 fps and ice moving in streams may make containment difficult. Concentrate containment at source and where oil enters stream. Aufeis is likely to cover much of upper West Fork of Chandalar R, including CS4-1; containment should be at upstream end of ice area. Oil can be trapped or flow under aufeis. Contain oil under aufeis where it surfaces naturally, or if necessary, dig trench through aufeis downslope of spill. Line downslope side of trench with membrane to force oil to surface. Remove oil as soon as possible to prevent subsurface backponding.

C-PLAN MAPS	17, 18
AERIAL MAPS	84 through 88
CONTAINMENT SITES	4-0, 4-1, 4-1A, 4-2

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

DIETRICH RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Dietrich R (fish, raptors)	The Dietrich River Contingency Area is located approx. 215 miles north of Fairbanks. This area encompasses 30.8 miles of pipeline from PLMP (b) (7)(F), (b) (3) A spill in this area could enter the Dietrich R directly at the pipeline crossings or indirectly through its tr butaries. The Dietrich R flows south to its confluence with the Bettles R, forming the Middle Fork of the Koyukuk R.	If oil has entered or threatens to enter the Dietrich R, IRTs will move to the contingency area via the Dalton Hwy or by helicopter. It is essential that the IRTs maintain radio contact with the reconnaissance teams patrolling the pipeline route for direction and status of the spill. 1. An IRT will be dispatched to CS4-3 at the confluence of the Dietrich and Bettles R. Earthmoving equipment could excavate large diversion containment pits in the Dietrich R floodplain adjacent to the river channel. The IRT will be prepared to deploy diversion booms to divert oil into these containment pits. The boom angle may have to be adjusted in response to changes in water levels, velocity, and spill volume. 2. Additional IRTs will be directed to a location downslope from the spill site with the objective of catching the leading edge of the oil. This IRT will be equipped to deploy diversion boom and construct containment pits. It will also be equipped to construct overflow dams with bypass systems in the side channels. 3. Additional IRTs will proceed to the spill site and implement containment actions. These teams will be prepared to construct underflow dams with water bypass systems, construct diversion berms to divert water away from the spill site, and if the spill is from the belowground pipe, they will excavate a series of transverse ditches across the floodplain to a depth below the water table to intercept and contain the subsurface flow of oil. Emphasize keeping oil from entering flowing water.	Summer Actions 1 through 3. The flow in the Dietrich R will probably be low and confined to one or possibly two channels. Booming operations may require the removal of ice and special efforts to keep booms free of ice.	Summer Actions 2 through 3. Booming operations should not be required. The IRT normally assigned to Action 1 will proceed downslope of the spill site and build snow berms surrounding the spill area. It may be necessary to trench through several feet of aufeis plus the gravel bed to intercept the subsurface flow of oil.	Summer Actions 1 through 3. During peak flow, all channels and the floodplain may be inundated with water flowing at high velocities. Action 2 will be difficult to implement. Emphasize Action 3 to keep as much oil as poss ble from entering flowing water.

CONTAINMENT INSTRUCTIONS

The Dietrich River Contingency Area is divided into four segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

DIETRICH RIVER

CONTAINMENT INSTRUCTIONS FOR DIETRICH RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
DIETRICH RIVER 1 (b) (7)(F), (b) (3) C-PLAN MAPS: 18 AERIAL MAPS: 87, 88, 89 CONTAINMENT SITES: 4-4 (b) (7)(F), (b) (3)	1. Dietrich R (fish, aptors)	(b) (7)(F), (b) (3)			(b) (7)(F), (b) (3) Use sorbent fences for containment. 4. If necessary for a leak in buried pipe, dig transverse ditches across floodplain to below water table to intercept and contain oil. These ditches may require impermeable linings to contain oil.	Summer Actions 1 through 4. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice.	Summer Actions 1 through 4, except use snow berms. Containment actions may need modification on Dietrich R due to aufeis and presence of open water. Oil can be trapped or flow under aufeis. Contain oil flowing under aufeis where it surfaces naturally, or if necessary, dig a trench through aufeis downslope of leading edge of spill, and line downslope side of trench with membrane to force oil to surface. Remove oil as soon as possible to prevent subsurface backponding. If oil enters open water, break unstable ice if necessary from edges of open reach until ice is thick enough to support recovery crew and associated equipment. Maintain equipment to keep it ice-free. If oil is only on ice surface, do not break ice.	Summer Actions 1 through 4. If necessary, modify Actions 3 and 4, as high water velocities and floating ice and debris may make containment extremely difficult. Emphasize containing spill before it reaches flowing water.
(b) (7)(F), (b) (3) C-PLAN MAPS: 18 AERIAL MAPS: 88, 89, 90 (b) (7)(F), (b) (3)	1. Dietrich R (fish, raptors)	(b) (7)(F), (b) (3)	with high aufeis potential. Normal flow during ice-free season ranges from 100 to 1,000 cfs, with velocities under 5 fps making containment feasible. During high flow, velocities could exceed 5 fps, and this coupled with large volumes of ice and debris could make containment extremely difficult.	Primary environmental objectives are: 1. Keep oil from Dietrich R or any tributaries. 2. Keep oil, if in tributaries, from Dietrich R. 3. Contain oil in Dietrich R at or before CS4-3. Other areas along Dietrich R could be used depending on local conditions. Soil is silt and silty gravel, with exception of Dietrich R floodplain at mouth of Oskar's Eddy, which is underlain by thawed gravel. Frozen soil is suscept ble to thermal and hydraulic erosion; thawed soil is suscept ble only to hydraulic erosion. Vegetated terrain is generally trafficable only in winter. Gravel floodplain is trafficable in all seasons. Avoid vegetated slopes and exposing bare soil whenever poss ble. (b) (7)(F), (b) (3)	First objective is to keep oil from reaching flowing water of Oskar's Eddy and Dietrich R. If oil enters these watercourses, objective is to contain oil in them at or prior to CS4-3. 1. Use material from workpad to build barriers and confine spill to workpad. 2. Install barriers, berms, or membrane-lined trenches in floodplain downslope of leading edge of spill to keep oil from reaching Oskar's Eddy and Dietrich R. 3. If oil enters Oskar's Eddy, build underflow dam at mouth of eddy and use sorbent fences for containment. 4. If necessary for a leak in buried pipe, dig transverse ditches across floodplain to below water table to intercept and contain oil. Line ditches with impermeable linings to keep oil from re-entering gravel materials.	Summer Actions 1 through 4. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice.	Summer Actions 1 through 4, except use snow berms. Containment actions may need modification on Dietrich R due to aufeis and presence of open water. Oil can be trapped or flow under aufeis. Contain oil flowing under aufeis where it surfaces naturally, or if necessary, dig a trench through aufeis downslope of leading edge of spill, and line downslope side of trench with membrane to force oil to surface. Remove oil as soon as possible to prevent subsurface backponding. If oil enters open water, break unstable ice if necessary from edges of open reach until ice is thick enough to support recovery crew and associated equipment. Maintain equipment to keep it ice-free. If oil is only on ice surface, do not break ice.	Summer Actions 1 through 4. If necessary, modify Actions 3 and 4, as high water velocities and floating ice and debris may make containment difficult. Emphasize containing spill before it reaches flowing water.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR DIETRICH RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
DIETRICH RIVER (b) (7)(F), (b) (3)	1. Dietrich R (fish, aptors)	By air or ground via pipeli workpad. No direct acces to workpad on west side Dietrich R. Access is by ATV or foot from Dalton Hwy 600 ft west to workp AR 108-APL-1A and 108-APL/AMS-1 provide access on east side of riv	(b) (7)(F), (b) (3)		First objective is to keep oil from reaching flowing water of Oskar's Eddy and Dietrich R. If oil enters these watercourses, objective is to contain oil in them at or prior to CS4-3. (b) (7)(F), (b) (3)	Summer Actions 1 through 6. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice.	Summer Actions 1, 2, 3, and 5, except use snow berms. Containment actions may need modification on Dietrich R due to aufeis and presence of open water. Oil can be trapped or flow under aufeis. Contain oil flowing under aufeis where it surfaces naturally, or if necessary, dig a trench through aufeis downslope of leading edge of spill, and line downslope side of trench with membrane to force oil to surface. Remove oil as soon as poss ble to prevent subsurface backponding. If oil enters open water, break unstable ice if necessary from edges of open reach until ice is thick enough to support recovery crew and associated equipment. Maintain equipment to keep it ice-free. If oil is only on ice surface, do not break ice.	Summer Actions 1 through 6. If necessary, modify containment actions, as high water volumes and floating ice and debris may make containment difficult. Emphasize containing spill before it reaches flowing water.

C-PLAN MAPS	18, 19
AERIAL MAPS	90, 92, 93
CONTAINMENT SITES	4-3, 4-4, 4-5

(b) (7)(F), (b) (3)

(b) (3), (b) (7)(F)

CONTAINMENT INSTRUCTIONS FOR DIETRICH RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
DIETRICH RIVER (b) (3), (b) (7)(F)	1. Dietrich R (fish, tors)	(b) (7)(F), (b) (3)			First objective is to keep oil from reaching flowing water of Dietrich R and tr butaries containing fishery resources. If oil enters these watercourses, objective is to contain oil in them at or prior to CS4-3. 1. Build barriers from material found along workpad to confine spill to workpad. 2. Install barriers, berms, or membrane-lined ditches downslope of leading edge of spill to keep oil out of any streams crossing pipeline workpad. If spill is near OMS 106-1, OMS 106-2, or OMS 105-1, build up sites to divert and contain oil, or use berms to divert oil to depressions in sites. 3. If oil enters any streams crossing workpad, contain at appropriate containment site using underflow dams, or diversion pits and booms. Use sorbent fences for containment. 4. If oil enters Dietrich R, deploy diversion booms to divert oil to side channels, abandoned meanders, or diversion pits dug in floodplain. If necessary, deploy booms in one general area to keep oil out of side channels and to direct oil to chosen containment site. Area south of Dietrich Camp is a good location with access via AR 104-APL/AMS-3. 5. If necessary for leak from buried pipe, dig transverse ditches to below water table to intercept and contain oil. Line ditches with impervious materials to keep oil from re-entering gravel materials.	Summer Actions 1 through 5. If necessary, break ice surface to allow containment. If oil is only on ice surface, do not break ice.	Summer Actions 1, 2, and 5, except use snow berms. Containment actions may need modification on Dietrich R due to aufeis and presence of open water. Oil can be trapped or flow under aufeis. Contain oil flowing under aufeis where it surfaces naturally, or if necessary, dig a trench through aufeis downslope of leading edge of spill, and line downslope side of trench with membrane to force oil to surface. Remove oil as soon as possible to prevent subsurface backponding. If oil enters open water, break unstable ice if necessary from edges of open reach until ice is thick enough to support recovery crew and associated equipment. Maintain equipment to keep it ice-free. If oil is only on ice surface, do not break ice.	Summer Actions 1 through 5. If necessary, modify Actions 3 and 4, as high water velocities and floating ice and debris may make containment difficult. Divert water away from spill site to allow trenching and containment. Emphasize containing spill before it reaches flowing water.

C-PLAN MAPS	18, 21
AERIAL MAPS	92 through 102
CONTAINMENT	4-3, 4-5, 4-7, 4-9,

(b) (3), (b) (7)(F)

(b) (7)(F), (b) (3)

MIDDLE FORK KOYUKUK RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Middle Fork Koyukuk R (fish, raptors, waterfowl)	(b) (7)(F), (b) (3)	1. If oil has entered or threatens to enter the MF Koyukuk R, deploy diversion booms across channels to divert oil to the gravel floodplain where depressions or abandoned channels exist. Containment pits will be dug as required to contain oil, but pits may have to be lined to keep oil from seeping through permeable gravel. The booms will be anchored at the pit end. The upstream end should be anchored so that the boom angle can be changed rapidly in response to changes in water levels, velocity, and spill volume. The containment site(s) selected will depend on existing water conditions and spill location. Potential sites and containment methods are as follows: • **Material Site 103-1, Aliquot Crk.** Divert oil to material site using booms with diversion berms and install berms with an inclined pipe at outlet of material site. • **Material Site 101-1.** Divert oil to material site using booms with diversion berms and install berms with an inclined pipe at outlet of material site. • **Material Site 97-1.** Divert oil to material site using booms with diversion berms and install berms with an inclined pipe at outlet of material site. • **CS4-16, booms.** Located at the confluence of Chapman Crk with MF Koyukuk R. • **CS4-16A, Conex site.** Located downstream of Chapman Crk/MF Koyukuk R confluence near Tramway Bar. 2. Initiate the above containment actions at a suitable containment site (as determined by reconnaissance) farther upstream on the MF Koyukuk R. Near the spill, side channels can be bermed on the downstream end to keep oil from reaching main channel(s). The upstream end should be bermed to prevent a rise in water level from flushing captured oil into major channel(s). 3. Implement containment actions at and near the leak source.	Summer Actions 1, 2, and 3. It may be necessary to break the surface of the ice to facilitate containment.	(b) (7)(F), (b) (3) Therefore, appropriate containment procedures will depend on the exact location of the leak and whether the pipe is elevated or buried. For example, if a spill occurred in an elevated portion and aufeis existed, the oil may be contained on the ice surface with snow and sorbents. However, for a spill in a belowground section, trenches may be cut through the aufeis to intercept the oil, and if active flow is encountered, booms or underflow dams will be used.	Summer Action 3. Concentrate containment activities at the point oil is entering flowing water, since containment within the MF Koyukuk R, or some of the major tributaries (e.g., Hammond R, Slate Crk, Rosie Crk, and Marion Crk), would not be effective. Containment also should be concentrated on small streams or side channels prior to the major channels of the MF Koyukuk R.

CONTAINMENT INSTRUCTIONS

The Middle Fork Koyukuk River Contingency Area is divided into seven segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

MIDDLE FORK KOYUKUK RIVER

CONTAINMENT INSTRUCTIONS FOR MIDDLE FORK KOYUKUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
MIDDLE FORK KOYUKUK RIVER 1 (b) (7)(F), (b) (3) C-PLAN MAPS: 21 AERIAL MAPS: 101, 102, 103 CONTAINMENT SITES: 4-11A (b) (7)(F), (b) (3)	1. Middle Fork Koyukuk R (fish, ors, waterfowl)	By air or ground via pipeline workpad. Preferred ground route is (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary objective is to keep oil from reaching flowing water of MF Koyukuk R. If oil enters this watercourse, objective is to contain oil in side channels and to divert it into MS 101-1. 1. Confine spill to workpad by building barriers with material found along workpad. 2. Install barriers downslope of leading edge of spill to keep oil out of small streams tributary to MF Koyukuk R. 3. Use Dalton Hwy culverts as containment points. Block appropriate structure using water bypass structures to keep oil out of floodplain of MF Koyukuk R. 4. If oil enters MF Koyukuk R floodplain, use materials from floodplain to build berms and dikes to keep oil away from flowing water. Dig containment pits with liners to keep oil from seeping through permeable gravel. Use sorbents for containment. 5. If oil enters flowing water of MF Koyukuk R, use diversion booms to divert oil into side channels, abandoned channels, depressions, and containment pits dug in high-water channels; line material sites containing permeable material to keep oil from seeping through permeable gravel.	Summer Actions 1 through 5. If necessary, break ice surface to allow containment. If oil is on surface, do not break ice. High-water channels will freeze before main channels; use berms on frozen high-water channels to keep oil from reaching flowing water.	Summer Actions 1 through 4, except use snow berms.	Summer Actions 1 through 4. Modify Actions 3 and 4, as necessary due to high velocities, floating ice, and debris. Emphasize containing oil before it enters a main channel of MF Koyukuk R.
MIDDLE FORK KOYUKUK RIVER 2 (b) (7)(F), (b) (3) C-PLAN MAPS: 21, 22 AERIAL MAPS: 102 through 110 CONTAINMENT SITES: 4-11A (b) (7)(F), (b) (3)	1. Middle Fork Koyukuk R (fish, tors, waterfowl)	By air or ground via pipeline workpad. Preferred ground route follows: (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)		First objective is to keep oil from reaching flowing water of Linda Crk, Gold Crk, Sheep Crk, Nugget Crk, and other small tributary streams. If oil enters these watercourses, objective is to contain oil in them at or prior to MF Koyukuk R. 1. Confine spill to workpad by building barriers with materials found along workpad. 2. Install barriers, berms or membrane-lined ditches downslope of leading edge of spill to keep oil out of streams crossing workpad. Use man-made barriers such as spur dikes and access roads where applicable. 3. If oil enters Linda, Gold, Sheep, Wolf Pup, or Nugget Crk or other small tr butaries, build diversion berms, containment pits, and underflow dams on wide gravel bars upstream of confluences of streams with MF Koyukuk R. Place structures above expected high-water level of MF Koyukuk to avoid flooding containment facilities. 4. If spill is from aboveground pipe and flows toward east edge of MF Koyukuk R, it will initially enter abandoned and high-water channels. Convert these to temporary containment sites by berming downstream end. Also berm upstream end to keep rising water from entering and flushing oil into main channels. 5. If oil reaches flowing water of MF Koyukuk R, use diversion booms at selected containment sites. Divert oil to containment pits, depressions, spur dikes, gravel pits or abandoned meanders. Line containment pits in permeable gravel to keep oil from seeping to flowing water. Anchor diversion booms at upstream end and so boom angle can be changed rapidly in response to changes in water levels, v (b) (7)(F), (b) (3) 6. 7.	Summer Actions 1 through 6. If necessary, break surface ice to allow containment.	Summer Actions 1 through 4 and 6, except use snow berms. Much of MF Koyukuk and tr butaries experience extensive aufeis. Contain spill from aboveground pipe on or adjacent to aufeis and remove before oil is entrained in ice. For a spill from buried pipe, dig deep trenching through aufeis and gravel bed to intercept and contain oil. Use water bypass systems as necessary.	Summer Actions 1 through 6. Modify Actions 3, 5, and 76because high flow and velocities, and floating ice and debris, may make containment extremely difficult. Emphasize containing oil before it enters MF Koyukuk R.

[redacted]

CONTAINMENT INSTRUCTIONS FOR MIDDLE FORK KOYUKUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
MIDDLE FORK (b) (7)(F), (b) (2)	1. Middle Fork Koyukuk R (fish, raptors, waterfowl)	(b) (7)(F), (b) (3)	Koyukuk R. Oil reaching south boundary of segment would enter MF Koyukuk R.		First objective is to keep oil from reaching flowing water of Union Crk, Hammond R., and MF Koyukuk R. If oil enters these watercourses, objective is to contain oil in these drainages. 1. (b) (7)(F), (b) (3) 2. I t 3. 4. I f 5. I t t	Summer Actions 1 through 5.	Summer Actions 1 through 3, except use snow berms.	Summer Actions 1 through 3. Emphasize containing oil before it enters a main channel of MF Koyukuk R.

C-PLAN MAPS	22, 23
AERIAL MAPS	109, 110, 111
CONTAINMENT SITES	4-11A

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

MIDDLE FORK KOYUKUK RIVER

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
MIDDLE FORK KOYUKUK RIVER (b) (7)(F), (b) (3)	1. Middle Fork Koyukuk R (fis raptors, waterfowl)	(b) (7)(F), (b) (3)		Primary environmental objectives are: 1. Keep oil out of flowing water of all creeks. 2. Keep oil that reaches creeks from reaching MF Koyukuk R. 3. Contain oil that reaches MF Koyukuk R in side channels before confluence with main channel of river. Soil consists of thaw-stable gravel (generally associated with belowground pipe) and frozen silt (generally associated with aboveground pipe). Limit off-road traffic to winter; however, use ATVs or Caterpillar tractors in all seasons along unvegetated portions of floodplain. Fish are present in Union, Minnie, Confusion, Pence's Pond, Marion, Sharon, Mary Angel, SF Mary Angel, Texas Slough, 1079 Slough, Organo, Equisetum, Clara, Clara Crk overflow, SF Clara, Calf, Slate, Spring, NF Spring, SF Spring, Rosie, Mud, Jackson, and Slough Crk and MF Koyukuk R. Waterfowl and raptors use floodplain and adjacent habitats seasonally.	F t (b) (7)(F), (b) (3)			Summer Actions 1 and 2. Concentrate containment activities to keep oil from entering flowing water, since containment in MF Koyukuk R or some major tributaries (e.g., Hammond R, Slate Crk, Rosie Crk, and Marion Crk) will not be effective. Also focus containment on small streams or side channels before major channels of MF Koyukuk R.

C-PLAN MAPS	23, 25
AERIAL MAPS	110 through 12
CONTAINMENT SITES	4-15, 4-16

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR MIDDLE FORK KOYUKUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
MIDDLE FORK KOYUKUK RIVER 5 (b) (7)(F), (b) (3) **C-PLAN MAPS** 25 **AERIAL MAPS** 122 **CONTAINMENT SITES** 4-15 (b) (7)(F), (b) (3)	1. Middle Fork Koyukuk R (fish, raptors, waterfowl)	(b) (7)(F), (b) (3)				Summer Actions 1 through 6.	Summer Actions 1 through 5, except use snow berms. Since pipe is elevated and streams do not contain flowing water in winter, contain oil on ice surface if it enters stream channels or lakes.	Summer Actions 1 through 5. Action 6 not feasible during breakup. Concentrate all efforts at keeping oil from passing hwy.
MIDDLE FORK KOYUKUK RIVER 6 (b) (7)(F), (b) (3) **C-PLAN MAPS** 25 **AERIAL MAPS** 122, 123, 124 **CONTAINMENT SITES** 4-16 (b) (7)(F), (b) (3)	1. Middle Fork Koyukuk R (fish, raptors, waterfowl)					Summer Actions 1 through 5.	Summer Actions 1 through 3, except use snow berms. Since pipe is elevated and streams do not contain flowing water in winter (except NF Windy Arm Crk, which is ice-covered with minimal flow), contain oil on ice surface if it enters stream channels or lakes.	Summer Actions 1 thr Ac no br di N du to an bo
MIDDLE FORK KOYUKUK RIVER 7 (b) (7)(F), (b) (3) **C-PLAN MAPS** 25, 26 **AERIAL MAPS** 122 through 125 **CONTAINMENT SITES** 4-16 (b) (7)(F), (b) (3)	1. Middle Fork Koyukuk R (fish, raptors, waterfowl)					Summer Actions 1 through 5.	Summer Actions 1 through 3, except use snow berms. Since pipe is elevated and streams do not contain flowing water in winter (except Chapman Crk which is ice-covered with discharge of 2 cfs), contain oil on ice surface if it enters stream channels or lakes. Use extreme care if oil enters Chapman Crk; focus efforts on containing oil on ice surface without breaking ice.	Su th Ac (3 fe du oil pr he co

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3) [redacted]

MIDDLE FORK KOYUKUK RIVER

(b) (7)(F), (b) (3)

SOUTH FORK KOYUKUK RIVER

SOUTH FORK KOYUKUK RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. South Fork Koyukuk R (fish, waterfowl, raptors)	(b) (7)(F), (b) (3) [redacted]	1. If oil has entered or threatens to enter the SF Koyukuk R at CS4-17, use a series of diversion booms to divert oil to the gravel bar and placer mine tailings on the east side of the river. The tailings are very permeable, so it will be necessary to use membrane liners to prevent the oil from seeping back into the river. If the oil has already reached this point, the team will fly downstream ahead of the leading edge of the spill and carry out the control action at a similar site downstream. Most of the gravel bars along the river are of adequate size to serve as helicopter landing sites. 2. Based on the reconnaissance assessment of the spill, initiate appropriate containment actions at either CS4-20, CS4-21, CS4-23, or CS4-18. 3. After locating the source(s) of the leak, initiate containment actions at and near the leak source.	Summer Actions 1 through 3. If the flow of water in the SF Koyukuk R is low and ice is beginning to form, Action 1 can be implemented farther upstream in the SF Koyukuk R so that the containment procedures can be implemented prior to the leading edge of oil.	Summer Actions 2 and 3. Open water leads have not been observed in the SF Koyukuk River within the immediate vicinity of the pipeline crossing; however, active flow beneath the ice does exist (approximate discharge 10 cfs). Anchor ice, as well as fairly extensive aufeis, exists above and below the crossing. Since the pipeline is elevated, oil should be contained on the ice surface with snow berms and sorbents. Care should be taken to avoid breaking the ice cover which allows oil to enter the active flow of the river.	Containment actions during this time will depend on site-specific water, snow, and ice conditions. 1. If the streams are mostly covered with ice, and water is beginning to flow over, under, or adjacent to the ice, initiate Summer Actions 1 through 3. 2. If the river or tributary streams are flowing at a high discharge with ice and debris, and the velocities are above 3 fps, Summer Actions 2 and 3 will be employed. Emphasize keeping the oil from entering flowing water where containment is extremely difficult. 3. If there is little or no floating ice and debris and the velocities are about 3 fps or less, Summer Actions 1 through 3 will be followed.

CONTAINMENT INSTRUCTIONS

The South Fork Koyukuk River Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

SOUTH FORK KOYUKUK RIVER

CONTAINMENT INSTRUCTIONS FOR SOUTH FORK KOYUKUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
SOUTH FORK KOYUKUK RIVER 1 (b) (7)(F), (b) (3) **C-PLAN MAPS** 25, 26 **AERIAL MAPS** 124, 125, 126 **CONTAINMENT SITES** 4-18, 4-20, 4-17 (b) (7)(F), (b) (3)	1. South Fork Koyukuk R (fish, waterfowl, raptors)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3) g SF Koyukuk R.	Primary environmental objectives are: 1. Keep oil out of intermittent tributary. 2. Keep oil in this drainage out of SF Koyukuk R. Soil consists of frozen silts, which are highly susceptible to thermal and hydraulic erosion. During off-road activities, ensure organic layer is not disturbed. Riparian zones along SF Koyukuk R floodplain and bog area near (b) (7)(F), (b) (3) ensitive to surface travel in all seasons. Fish are present in SF Koyukuk R, and waterfowl and raptors use river valley.	Objective is to keep oil from reaching flowing water. If intermittent tributary is flowing, block it with water bypass system. If no flow, block drainage completely to use for oil containment. If oil enters SF Koyukuk R, use diversion booms and barriers to divert oil to side channels or gravel bars. 1. Build berms or barriers with material from workpad, MS 94-0.2, OMS 95-1.0, MS 95-2, or OMS 96-1, and confine spill to workpad. If spill is north of hwy/pipeline intersection between PLMP 253.0 and 253.3, spill should be confined by road embankment. 2. Build berm, membrane-lined ditch, or barrier in front of leading edge of spill to keep oil out of bog or intermittent tributary. 3. If oil enters or is likely to enter bog near PLMP 253.3, block outlet of bog. 4. If oil enters or is likely to enter intermittent tributary, block drainage above its entry to SF of Koyukuk R at CS4-18. 5. If oil enters or is likely to enter SF Koyukuk R, move to CS4-20 or suitable location downstream from leading edge of spill such as CS4-17; deploy diversion booms and divert oil to side channels or gravel bars.	Summer Actions 1 through 4.	Summer Actions 1 through 4, except use snow berms.	Summer Actions 1 through 4. Action 5 is not practicable during breakup; however, CS4-18 probably could be used at all times except for 5 to 10 days during breakup. Concentrate containment at source of leak and where oil enters flowing water.
SOUTH FORK KOYUKUK RIVER 2 (b) (7)(F), (b) (3) **C-PLAN MAPS** 26 **AERIALS** 125, 126 **CONTAINMENT SITES** 4-21, 4-20, 4-18, 4-17 (b) (7)(F), (b) (3)	1. South Fork Koyukuk R (fish, waterfowl, raptors)	By air or ground via pipeline workpad. Preferred ground route: (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	Primary environmental objective is to keep oil out of SF Koyukuk R. Soil consists of frozen silt, which is highly susceptible to thermal and hydraulic erosion. Extreme care should be taken during off-road activities to ensure that organic layer is not disturbed. Specifically, riparian zones along SF Koyukuk R floodplain, steep slopes north of SF Koyukuk R, and bog areas west of pipeline are sensitive to surface disturbance during all seasons. Fish are present in SF of Koyukuk R, and waterfowl and raptors use river valley.	Objective is to prevent oil from reaching SF Koyukuk R. If oil enters river, containment efforts should use diversion booms, sorbents and associated gravel bar pits. Side channels can be blocked by constructing berms and barriers. 1 (b) (7)(F), (b) (3) 2. Build berm, membrane-lined ditch, or barrier in front of leading edge of spill if such activity would keep oil out of SF Koyukuk R. 3. If oil enters or appears likely to enter SF Koyukuk R, move to area of CS4-18 or CS4-21, depending upon leak location, and implement actions. Side channel can be blocked with berms using suitable water bypass systems. Oil can then be diverted into pits dug in gravel bar. At CS4-21 on main channel, multiple sets of diversion booms may be used to divert oil onto gravel bars or into pits dug in gravel. Drainage at CS4-18 can be blocked above its entry to SF Koyukuk R if no flow is present; otherwise use water bypass system. 4. If oil escapes containment efforts at CS4-21, or has already bypassed this location, move to CS4-17 or suitable containment site downstream from leading edge of spill, and contain oil by deploying booms and sorbents. Oil may be diverted into side channels and onto gravel bars.	Summer Actions 1 through 4.	Summer Actions 1 through 3, except use snow berms. Open water leads have not been observed in SF Koyukuk R within immediate vicinity of pipeline crossing; however, active flow beneath ice does exist (approximate discharge 10 cfs). Anchor ice, as well as fairly extensive aufeis, exists above and below crossing. Since pipeline is elevated, oil should be contained on ice surface with snow berms and sorbents. Care should be taken to avoid breaking ice cover which would allow oil to enter active flow of river.	Summer Actions 1 and 2. Containment within SF Koyukuk R will not be practicable during breakup period. Containment activities should be concentrated at source of leak and at those points where oil is entering flowing water.

(b) (7)(F), (b) (3)

SOUTH FORK KOYUKUK RIVER

CONTAINMENT INSTRUCTIONS FOR SOUTH FORK KOYUKUK RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

SOUTH FORK KOYUKUK RIVER

(b) (7)(F), (b) (3)

JIM RIVER

JIM RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
1. Jim River (fish, waterfowl, raptors) 2. Grayling Lake (fish, waterfowl) 3. Prospect Creek (fish, waterfowl) 4. South Fork Koyukuk River (fish, waterfowl)	(b) (7)(F), (b) (3)	1. If oil has entered or threatens to enter the Jim R, move by boat, helicopter, or ATV to CS4-26 approx. 2 miles below the confluence of the Jim R and Prospect Crk. Multiple diversion booms may be deployed and berms may be constructed to facilitate containment. If required, containment pits can be dug so that oil can be diverted into these holding areas. 2. Implement containment actions at and near the leak source.	Summer Actions 1 and 2. It may be necessary to break surface ice in the Jim R and to deploy debris screens to catch floating ice in order to facilitate containment.	Summer Action 2. If oil has entered the Jim R in the vicinity of the main crossing(b) (7)(F), containment should be attempted within the river above its confluence with Dee Crk, since this area probably will have minimal surface flow and ice-cover thickness less than 2 ft. However, if oil has entered the river in the vicinity of Douglas Crk or the Jim R side channel, containment should be attempted in the expected open water areas in the Jim R side channel and the Jim R. Open water areas have been observed in the Jim R above and below its confluence with Prospect Crk.	Summer Actions 1 and 2. Floating ice and debris can be expected for at least five days; during this time period, boom deployment will not be feasible. Efforts should be concentrated at the source of the leak and the point where oil enters the river.

CONTAINMENT INSTRUCTIONS

The Jim River Contingency Area is divided into seven segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

JIM RIVER

CONTAINMENT INSTRUCTIONS FOR JIM RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR JIM RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR JIM RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3) [redacted]

CONTAINMENT INSTRUCTIONS FOR JIM RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR JIM RIVER SEGMENTS

	PRIORITY ENVIRONMENTAL			ENVIRONMENTAL	CONTAINMENT ACTIONS			
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

BONANZA AND FISH CREEKS CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Bonanza/Fish Creeks Contingency Area is divided into eight segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR BONANZA AND FISH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR BONANZA AND FISH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR BONANZA AND FISH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR BONANZA AND FISH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

KANUTI RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Kanuti River Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR KANUTI RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR KANUTI RIVER SEGMENTS

	PRIORITY ENVIRONMENTAL			ENVIRONMENTAL	CONTAINMENT ACTIONS			
(b) (7)(F), (b) (3) [redacted]								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

WEST FORK DALL RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The West Fork of the Dall River Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR WEST FORK DALL RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

RAY RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Ray River Contingency Area is divided into the 10 segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR RAY RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR RAY RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR RAY RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR RAY RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR RAY RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

YUKON RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS

The Yukon River Contingency Area is divided into nine segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR YUKON RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

[redacted]

CONTAINMENT INSTRUCTIONS FOR YUKON RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR YUKON RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

ISOM CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Isom Creek Contingency Area is divided into two segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR ISOM CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

HESS CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL	DESCRIPTION OF	PRIORITY CONTROL ACTIONS			
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Hess Creek Contingency Area is divided into eight segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HESS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HESS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								
			containment feas ble. During high flow, velocities could exceed 5 fps, and this, coupled with large volumes of ice and debris (breakup), could make containment extremely difficult.					

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HESS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HESS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HESS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HESS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

TOLOVANA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Tolovana River Contingency Area is divided into seven segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TOLOVANA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TOLOVANA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TOLOVANA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TOLOVANA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

TATALINA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Tatalina River Contingency Area is divided into 10 segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TATALINA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TATALINA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TATALINA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

WASHINGTON/AGGIE CREEKS CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Washington/Aggie Creeks Contingency Area is divided into seven segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR WASHINGTON/AGGIE CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR WASHINGTON/AGGIE CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR WASHINGTON/AGGIE CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

(b) (7)(F), (b) (3)

CHATANIKA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Chatanika River Contingency Area is divided into the six segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR CHATANIKA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR CHATANIKA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR CHATANIKA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

several ft to 5,000 ft, before reaching flowing water.

(b) (7)(F), (b) (3)
[redacted]

GOLDSTREAM CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Goldstream Creek Contingency Area is divided into six segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR GOLDSTREAM CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR GOLDSTREAM CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

CHENA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS

The Chena River Contingency Area is divided into four segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR CHENA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR CHENA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

MOOSE/FRENCH CREEKS CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS

The Moose/French Creeks Contingency Area is divided into four segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR MOOSE/FRENCH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR MOOSE/FRENCH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

LITTLE SALCHA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY	DESCRIPTION OF	PRIORITY CONTROL ACTIONS			
(b) (7)(F), (b) (3) [redacted]					of oil of

CONTAINMENT INSTRUCTIONS

The Little Salcha River Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR LITTLE SALCHA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

SALCHA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

The Salcha River Contingency Area is divided into five segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SALCHA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SALCHA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SALCHA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

SHAW CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Shaw Creek Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SHAW CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SHAW CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SHAW CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

BIG DELTA/DELTA JUNCTION CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Big Delta/Delta Junction Contingency Area is divided into 10 segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR BIG DELTA/DELTA JUNCTION SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR BIG DELTA/DELTA JUNCTION SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR BIG DELTA/DELTA JUNCTION SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR BIG DELTA/DELTA JUNCTION SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

JARVIS CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Jarvis Creek Contingency Area is divided into seven segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR JARVIS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR JARVIS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR JARVIS CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

DELTA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Delta River Contingency Area is divided into six segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

The Delta River is a typical, braided river and channels are subject to change from one runoff to the next. For this reason, only a limited number of containment sites have been specifically identified in this plan. Other suitable containment sites may be found along the river. It is the responsibility of the Operation Section Chief to locate alternate sites according to local conditions.

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR DELTA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR DELTA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR DELTA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR DELTA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR DELTA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

TRASHY MOUNTAIN CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Trashy Mountain Contingency Area consists of one segment. Specific containment instructions are provided for this segment; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TRASHY MOUNTAIN SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

PHELAN CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL	DESCRIPTION OF	PRIORITY CONTROL ACTIONS			
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Phelan Creek Contingency Area is divided into seven segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PHELAN CREEK SEGMENTS

SEGMENT	ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PHELAN CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PHELAN CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

procedures.

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR PHELAN CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

PAXSON/SUMMIT LAKES CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Paxson/Summit Lakes Contingency Area is divided into 21 segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)
[redacted]

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)
[redacted]

CONTAINMENT INSTRUCTIONS FOR PAXSON/SUMMIT LAKES SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

SPRING CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Spring Creek Contingency Area is divided into five segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SPRING CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR SPRING CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

HAGGARD/SOURDOUGH CREEKS CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Haggard/Sourdough Creeks Contingency Area is divided into five segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HAGGARD/SOURDOUGH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR HAGGARD/SOURDOUGH CREEKS SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GULKANA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Gulkana River Contingency Area is divided into three segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR GULKANA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

nesting waterfowl.

(b) (7)(F), (b) (3)
[redacted]

DRY CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Dry Creek Contingency Area is comprised of one segment. Specific containment instructions are provided for this segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR DRY CREEK SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								

(b) (7)(F), (b) (3)

TAZLINA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)					

CONTAINMENT INSTRUCTIONS

The Tazlina River Contingency Area is divided into five segments. Specific containment instructions are provided for these segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TAZLINA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3)								
					5. If spill is south of PS11, direct flow down workpad to cleared area at Tazlina Bridge site. Excavate and/or berm as necessary to contain oil.			

(b) (7)(F), (b) (3)

CONTAINMENT INSTRUCTIONS FOR TAZLINA RIVER SEGMENTS

SEGMENT	PRIORITY ENVIRONMENTAL AREAS	ACCESS	ASSESSMENT	ENVIRONMENTAL SENSITIVITIES	CONTAINMENT ACTIONS			
					SUMMER	FREEZEUP	WINTER	BREAKUP

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)
[redacted]

YETNA CREEK CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Yetna Creek Contingency Area is composed of one segment. Specific containment instructions are provided for this segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)
[redacted]

KLUTINA RIVER CONTINGENCY AREA

PRIORITY CONTROL ACTIONS

Control actions will be initiated with consideration of the priority environmental areas listed in order of importance in the table below. The primary objective will be to keep oil from reaching these zones, but if oil enters such an area, every reasonable effort will be made to stop its spread and to minimize additional disturbance during containment, recovery, and disposal.

Following notification of a spill, the Operations Section Chief will initiate the following priority control actions as determined by seasonal conditions and reconnaissance observations. These actions may be changed as field conditions require, as in cases when actions at additional locations would improve human safety or minimize environmental damage.

PRIORITY ENVIRONMENTAL AREAS	DESCRIPTION OF ENVIRONMENT	PRIORITY CONTROL ACTIONS			
		SUMMER	FREEZEUP	WINTER	BREAKUP
(b) (7)(F), (b) (3) [redacted]					

CONTAINMENT INSTRUCTIONS

The Klutina River Contingency Area is composed of one segment. Specific containment instructions are provided for this segments; however, these actions have been developed as guidelines for all oil spills. Under various field conditions, it may be necessary to deviate from the instructions to provide a more efficient and less damaging containment of an oil spill. Actions may be initiated simultaneously (1) at the spill source and (2) downslope from the leading edge of the spill.

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)



(b) (3), (b) (7)(F)

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)



(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Section 4. Tactics

Section 4 of Volume 3 of the TAPS C-Plan contains response tactics covering the following subjects:

- Containment and Exclusion
- Pump Station Containment and Control Strategies
- Recovery Strategies
- Damaged Storage Tank Transfer Procedures
- Recovered Oil Transfer, Storage, and Disposal
- Bird and Terrestrial Mammal Hazing
- Shoreline Cleanup Techniques

4.1 CONTAINMENT AND EXCLUSION

This section discusses the construction and/or deployment of physical barriers to limit the spread of an oil spill and to exclude oil from sensitive areas. This section is divided into two subsections:

- *Containment and Exclusion Techniques:* Description of specific actions such as berm construction, boom deployment, etc.
- *Implementation of Containment and Exclusion Techniques:* Discussion of the use of containment and exclusion techniques under summer, winter, and breakup conditions at typical spill locations (workpad, tundra, forest, small creeks, etc.).

4.1.1 Discussion of Containment and Exclusion Techniques

There are seven basic techniques which, when used singly or in combination, can help limit the spread of spilled oil or to exclude it from sensitive areas:

- Dams
- Berms (dikes)
- Culvert blocking
- Interception barriers
- Booming
- Sorbents
- Trash fences

Because some of these techniques involve removal or disturbance of vegetation cover, it must be remembered that many of the soils along the pipeline route are extremely sensitive and such disturbance can cause thermal and hydraulic erosion. Recommended precautions to prevent erosion are discussed in Volume 1, Section 1.6 of this C-Plan and should be consulted first. If doubt exists and time permits, outside expertise on sensitive soil should be obtained. It is suggested that a simplified selection method similar to that discussed in *MR-48, Trans-Alaska Pipeline Maintenance and Repair Manual,* be provided to aid in structure selection.

A second factor to consider is the availability of on-site storage for contained or diverted oil. The area where oil is being diverted must be either capable of storing all the oil or the oil must be removed from the storage area. The same holds for spills being stored upslope from a containment device or structure, which will only be effective if it is capable of storing the contained oil or if the contained oil is rapidly removed from behind the device or structure.

Containment and exclusion techniques should be selected to reduce the environmental impact of the response and minimize the impact of the spill. A comparison of response methods and their impact is provided in “Options for Minimizing the Environmental Impact of Freshwater Spill Response,” (NOAA/API, June 1994).

4.1.1.1 Dams

There are two types of dam construction appropriate for oil spill containment: the complete blocking of an actual or potential drainage course (a *blocking dam*), and the blocking of oil flow while letting water continue downslope (an *underflow dam*).

Blocking Dams

Blocking dams should be built only across drainage courses with little or no water flow. The dam should be situated at an accessible point where there are high banks on the upstream side. It must be well keyed into the banks and buttresses to support the oil and water pressure. It can be constructed from several types of materials including earth, snow, sandbags, sheets of metal, or wood, or any material that blocks flow. Snow can be used to construct a dam for winter spill containment as long as the snow cover is sufficient to provide material to work with and prevent damage to underlying vegetation and soil. A spill may occur during conditions of frozen ground and no snow cover. Use of material sites for control actions is approved, and other materials can be improvised from nonessential portions of a workpad.

The dam can be built across the drainage course to form a holding pond or reservoir to contain the oil and water. Water trapped behind the dam can be pumped out by placing the suction (intake) hose at the base of the dam on the upstream side, leaving oil trapped behind the dam for subsequent removal. The discharge (outlet) hose should be placed on the downstream side. Trapped water can also be moved across the dam with one or more siphons.

Underflow Dams

For waterways with higher stream flow rates, an underflow dam can be used. If the dam is to be effective, the surface of the oil must always be below the lip of the dam, and the oil/water interface must be above the top of the underflow opening. To maintain the proper level, it is necessary to remove some of the water, usually through horizontal valved or inclined pipes.

The underflow dam can be built by placing pipes of appropriate size on the stream bed and building an earthen or sandbag dam over the pipe across the waterway. The diameter of the pipe will depend on the flow rate of the stream and the depth of the water behind the dam. For example, 24-inch to 30-inch diameter pipe will have sufficient capacity for a flow rate of up to 30 cfs. If time does not allow for pipe diameter calculations, a diameter larger than required will control flow if it is inclined at the proper angle or if a valve is used. A pair or series of dams may be required downstream if sufficient underflow cannot be maintained.

4.1.1.2 Berms

Unlike dams, which are designed either to block flow completely or to block flow with a provision for underflow, berms are constructed to control flow by diversion or overflow. For creeks and rivers, overflow berms (weirs) or diversion berms can be constructed from materials in the floodplains; for terrestrial spills, earth berms can be built to divert or impede flow.

In fast-moving streams, berms may have to be continually maintained. In winter, snow may be used for berm construction wherever there is sufficient snow. Multiple berms should be used and maintained on a 24-hour basis such that oil does not channelize beneath the snow and bypass the berm. In addition, use snow as a sorbent to collect oil behind various containment structures.

Diversion Berms

Diversion berms would be built from floodplain materials on large rivers such as the Delta and Sagavanirktok (Figure 4-25). In most situations, they should be constructed in a series, connected with short pieces of boom in a pattern that forces oil to flow into a containment pit, side channel or similar feature for temporary storage. The spacing between each berm should allow water to flow under the connecting booms while forcing oil to the side. The size and angle of the berms will be dictated by stream velocity, channel size and oil spill volume. As these factors increase, the required size of the berms will increase, and the angle between the upstream side of the berms and the stream bank will decrease.

Overflow Berms (Weirs)

The purpose of overflow berms or weirs is to reduce water velocity by widening and deepening the stream. They can be built in smaller streams such as Moose Creek and the Kanuti River, or in the side channels of larger rivers.

Overflow berms must be constructed across the entire channel. Materials should be excavated from the upstream side of the berm, creating a pool where stream flow will be retarded, permitting boom deployment and oil removal upstream from the berm. The required height and width of the berm will increase with stream depth and water velocity.

Berms Built On Land

In most cases, berms built on land act as barriers to spill flow. They may also be used to divert the flow of oil in a different direction so as to protect a sensitive area. A windrow of materials along a road or highway can keep a spill from crossing the road, or can divert it into a storage area (Figure 4-26). Berms built around sensitive areas can exclude oil from these areas.

4.1.1.3 Culvert Blocking

The blocking of culverts is an important part of the TAPS C-Plan because the pipeline parallels highways and roads for much of its length. Several ways are available to block culverts, but the most effective is to pile dirt, sand or similar earthen material over the end of the culvert. Placing sandbags or sheets of plywood over the end will also stop or retard flow. In the winter, snow may be used wherever there is adequate snow cover.

To block culverts containing flowing water, it may be necessary to install an underflow device or a pump or siphon to remove impounded water. Small volumes of water can be passed through a pipe covered with sandbags or dirt. Larger culverts that transport entire streams, such as those on the Little Tonsina River, will require a more complicated underflow device that can be built from large timbers, steel pipe and plating. Two pieces of pipe can be welded to a steel plate (the dimensions of the pipe and plate will depend on the size of the culvert). Larger timbers with holes drilled in each end can be slipped over the pipes to act as the dam. Small blocks (chocks) can be inserted between the bottom timber and the steel plate to provide space for water to flow; the size of the chocks will vary with the volume of water that has to be removed from behind the dam.

4.1.1.4 Interception Barriers

Interception barriers consist of trenches, ditches and sheets of metal or plywood that intercept subsurface flow of spilled oil (Figure 4-27). Subsurface flow may be through a permeable layer that may or may not be transporting groundwater. It may also be between the vegetative mat and the ground surface. Trenches and sheet barriers may be used separately or together.

The direction of subsurface flow must be determined before a barrier is installed. First, a surface reconnaissance of the area should be made. There may be pools of oil on the ground, dying or dead vegetation, or an odor of oil. If there are gullies that provide exposed banks, the banks should be examined closely for seeping oil. The entire area of suspected subsurface oil flow should be checked.

Probe rods and hydrocarbon sniffers and driving equipment can be used. If these are unavailable, the boundaries of subsurface contamination can often be located by the “poke and sniff” method. Subsurface geology may permit oil to flow in directions that do not coincide with surface gradients. Smaller leaks will be difficult and may not be located for some time.

Trenches

Trenches can be effective for containing oil flow through a subsurface layer. Care should be exercised in selecting a site. The type of soil must be considered since excavating a trench in permanently frozen soil may cause more damage (through thermal erosion) than the subsurface migration of the oil.

The trench should be excavated at right angles to subsurface flow. Local terrain may dictate that the trench be angled upslope at either end. The depth of the trench depends on the depth of the oil; the trench should extend about 18 inches below the oil level. The downstream side and bottom of the trench should be covered with plastic sheeting or a similar impermeable material. The trench should be wide enough to accommodate the anticipated method of oil/water removal. If a floating skimmer is to be used, a portion of the trench will have to be wide enough for the skimmer. The trench need not be widened for sorbents and/or a pump with a floating skimming head.

Sheet Barriers

Like trenches, sheet barriers can be used where the flow is near the surface and/or where the ground will allow them to be driven deep enough to intercept the flow of oil. Ideally, they should extend to about 18 inches below the oil level, and up from the ground surface to create a ponding area for the oil. They can be driven into the ground with an air hammer fitted with a shoe to spread impact over the entire edge of the sheet. The sheets should be installed so that they overlap. As with trenches, sheet barriers should be installed at right angles to the subsurface flow, and they may bend upslope at the ends.

4.1.1.5 Booming

Two types of boom deployment apply to potential oil spills along the pipeline route:

- Block the flow of oil
- Divert oil to a collection point

For any of the booms below to be effective during freezeup, winter, or breakup, they will require 24-hour maintenance (e.g., ice will have to be continually broken and removed).

Booms to Block the Flow of Oil

Such booms are generally deployed from bank to bank or from shore to shore. The boom is normally deployed to divert the oil as discussed below. The angle of the boom can be determined as shown in Figure 4-34.

Booms deployed across the inlet stream to a lake may keep oil from reaching the lake itself (Figure 4-28). Boom the inlet and provide preventive booms farther into the lake, if necessary, or containment booming along the shore to minimize impact on the lake. In the case of a large spill, the outlet of a lake can be boomed so that the surface of the lake can be used as a large storage area. To prevent a spill from spreading once it has reached a lake, two boats towing a long boom can completely encircle the slick.

Booms deployed across a river or stream will usually contain the flow of oil if current velocity is less than about one knot (1.7 fps). Wind will affect surface water velocity by a factor of approximately 3% of the wind speed. This should be taken into consideration when wind is blowing downstream, upstream, or across a lake. If this technique is used, the oil will have to be removed rapidly from the upstream side of the boom. The technique is not likely to be useful on larger rivers. Whatever the body of water, current velocities over 1 knot will make it difficult, if not impossible, to block the flow of oil; then diversion booming will be necessary.

Where oil is flowing into a lake or stream over the bank or leaking from the ground into a water body, booms can be placed parallel to the bank. This creates a quiet surface from which the oil may be skimmed. Booms can also be placed parallel to shorelines and banks to exclude oil from sensitive areas.

Diversion Booming

Diversion booms are deployed to direct oil towards a containment pit/collection area or to divert oil away from environmentally sensitive areas. They can be deployed as single or connected sections of boom, multiple boom staggered across main or side channels, or in conjunction with berms or river bars — the specific technique depends on river characteristics and size.

When using diversion booms to divert oil towards a containment pit/collection area, the downstream end at the collection area is anchored by natural features (rocks and trees), steep pipes, or tracked vehicles, and the upstream end is fixed to a berm, boat, or tracked vehicle. The choice of upstream anchors depends on river size, system characteristics (incised or braided), and whether or not the boom angle needs to be adjusted in response to water velocity and spill volume. Diversion booms deployed to protect environmentally sensitive areas will generally be fixed between boats, natural features, or berms.

Collection Areas and Diversion Pits

Oil spills reaching moving bodies of water such as streams and rivers may be contained by diverting the spill with berms and booms to a collection area or containment pit adjacent to the affected water system.

Earth-moving equipment arriving on site may be used to create temporary storage containment sites in the terrain with storage capacities ranging from 2,000 to 40,000 gallons. However, agency approval and/or permitting would be needed for use of earth-moving equipment. In incised river systems, it may not be feasible to excavate a containment pit, and oil will have to be diverted to high-water channels, oxbow lakes, or areas of relatively quiet water.

Temporary terrain-storage capacities would vary according to the geographical considerations at each site. Possibilities may include, but are not limited to, the use of natural oxbows, sloughs, ponds, or eddies in watershed systems to contain sufficient quantities and therefore help in response and containment efforts. Naturally occurring terrestrial depressions might also be used.

In braided river systems, containment pits should be excavated in the floodplain, although existing material sites and other pits such as abandoned gravel pits should be used wherever feasible. If conditions allow, the pits should be at approximately the same angle as berms and booms in the river channel, and the pits will have to be made impermeable. This can be accomplished most simply by excavating the pit below the groundwater table so that the bottom of the pit will contain standing water and oil diverted into the pit will float on the water, preventing the spill from seeping into the underlying materials. The sides of the pit can be covered with plastic sheeting, clays, or similar impermeable materials so that the spill cannot flow through the sides of the pit. If the water level of the pit becomes too high, excess water can be discharged via underflows, siphons, or pumps. Also, if the water level cannot be maintained, additional water can be added to the pit with pumps or by adjusting the booms, diverting oil into the pit; or the pit can be deepened, moving the boom closer to the water table.

The spill can be diverted to the collection area or containment pit by developing a series of diversion booms or berms upstream from the mouth of the pit. If the stream flow is too great for effective booming, a series of berms connected with booms can be built. If diversion booms are to be constructed in the actual river channel, they should be constructed in a series in order to force oil to flow into the containment pit. The deployment booms between the berms will force the oil to flow towards the pit and allow the water to continue downstream. The spacing between each berm will allow the water to flow beneath the connecting booms while forcing the oil to the side, like an underflow device. The size and angle of the berms and booms will be dictated by stream velocity, channel width, and depth and oil spill volume. As these factors increase, the required size of the berms will increase and the angle between the upstream side of the berms and the stream bank will decrease. The proper deployment angle can be found by attaching one end of the boom to a secure point and the other to a boat. The mobile end can be moved up and downstream until it reaches a position where oil flow is parallel to the boom rather than over or beneath it.

Diversion berms in channels containing flowing water will have to be continuously maintained to keep the force of the current from eroding the berm away. Sandbags or other protective material may be used on the upstream sides of the berms to help prevent erosion. Figure 4-28 shows a plan view of a berm and boom diversion device.

Diversion booming in lakes or ponds can be accomplished by fixing one end of the boom to the shore and the other end to a boat. This technique is not required on lakes or ponds except during high winds (above 25 knots). However, it should be used to protect sensitive shoreline areas and to assist in oil cleanup. The end of the boom fixed to the shore should divert oil to a pump with a floating skimmer head, or into a water-borne skimmer which, in turn, will pump oil to onshore storage. Oil removal should proceed rapidly because of the small amount of storage behind a boom.

4.1.1.6 Sorbents

The proper use of sorbents is an integral part of the overall containment plan. Sorbents should be used whenever mechanical skimming/suction devices cannot be used or are unavailable. Sorbents are also used frequently in conjunction with mechanical equipment.

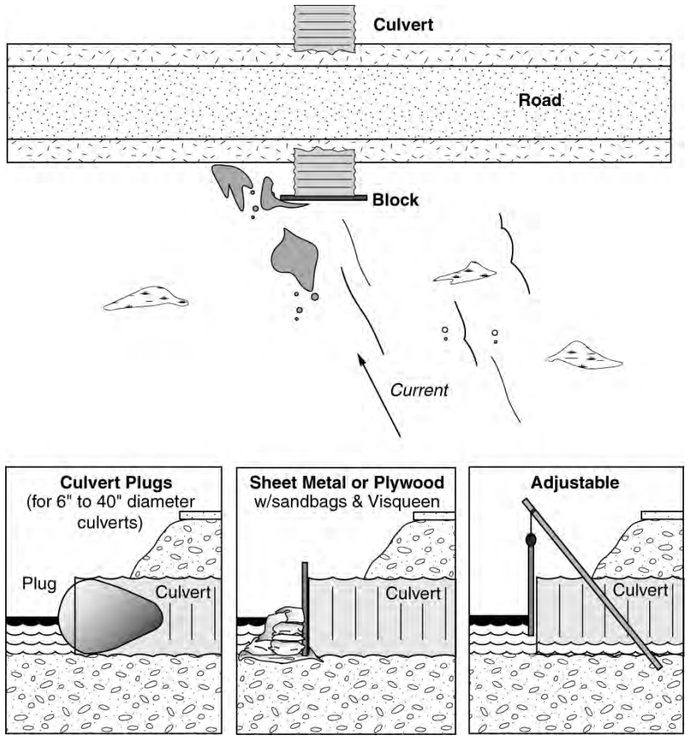
Sorbents should never be used on water unless there is a definite way to recover them. Sorbent material can be reused after squeezing the collected oil out into a container.

Sorbents are a practical approach for handling small oil spills on water and for cleaning up light oily sheens on water from larger spills. Sorbents often provide the only environmentally acceptable means for terrestrial cleanup of small spills.

4.1.1.7 Sorbent/Trash Fences

Sorbent fences may be used wherever stream depth or configuration renders dams, berms, or booms impractical. Such fences can be constructed quickly with stakes, wire mesh, and sorbent materials. Sorbent booms, pads, sheets, chips, or straw can be used effectively. The mesh will hold the sorbent material while allowing the passage of water. This technique will require 24-hour maintenance to remove the oil-saturated sorbents and replace them with additional sorbents.

Deeper streams with excessive amounts of debris may also require the use of upstream trash fences to allow for the effective use of dams, berms, or booms.



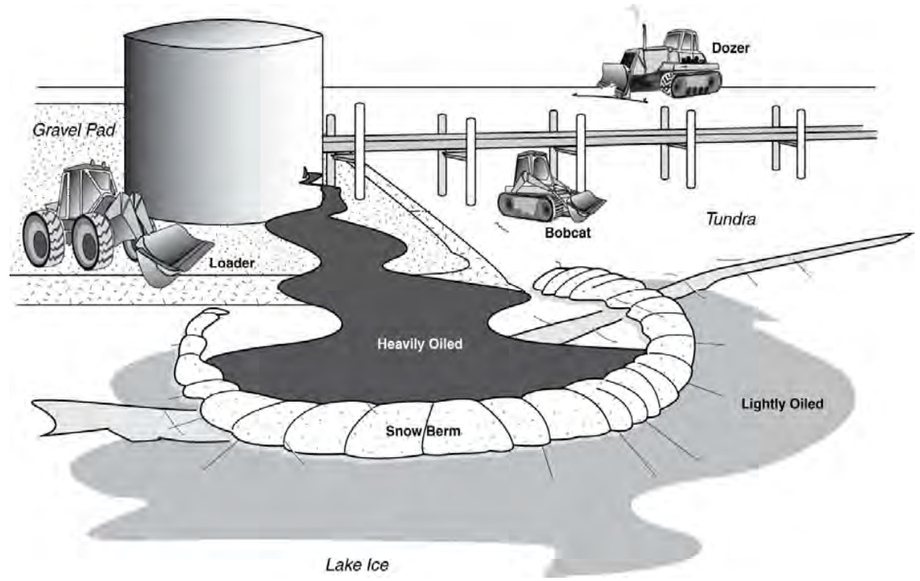
Deployment Considerations

- Appropriate during breakup and summer, when the flow to the culvert is small enough so that the road won't be washed out.
- Also can be used if high-volume pumps are available to pump water over the road to the other side of the culvert.
- When working with equipment around or near an aboveground pipeline, a spotter must be added to each front-end loader or dozer.

A culvert is blocked using sheet metal, plywood barriers, or inflatable culvert plugs. Use a full block only when the culvert will be blocked for the entire cleanup operation, if the oil floating on the water will not contaminate additional soil or tundra, and if blocking the water flow will not threaten the road. Otherwise, an adjustable weir should be used.

Plywood and/or sandbags can also be used as culvert blocks, but are more labor-intensive. A wood block may require a headwall with kickers oriented to support the boards or plywood. Place the blocking materials over the upstream end of the culvert. Plastic sheeting over the outside of the block will prevent oil penetration.

FIGURE 4-1 CULVERT BLOCKING



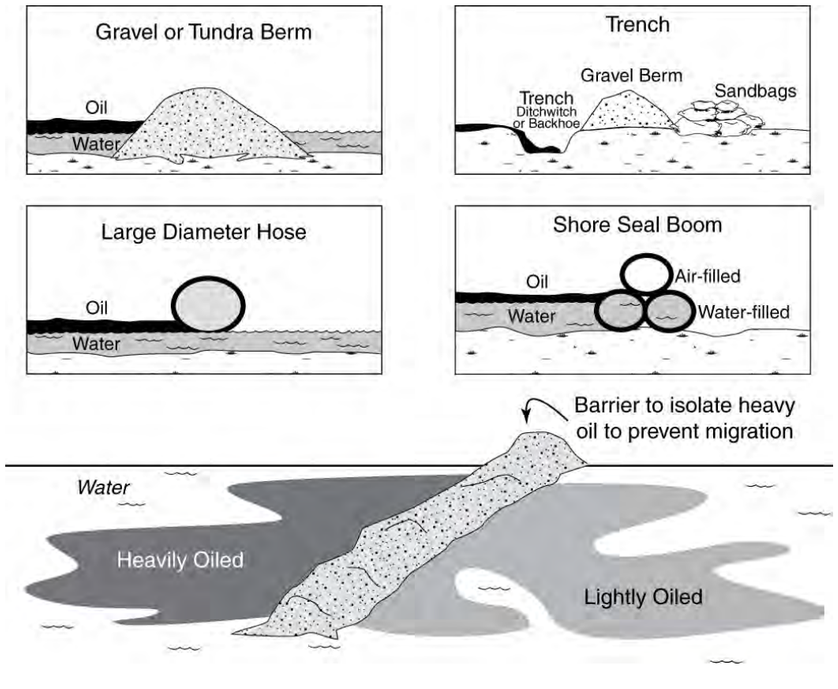
Deployment Considerations

- A dozer is the most efficient piece of equipment in snow berm construction, and can access tundra and ice-covered lakes. If insufficient snow cover exists, front-end loaders would provide the dozer with snow.
- When working with equipment around or near the aboveground pipeline, add a spotter to each front-end loader and dozer.
- When ice-reinforced, snow berms are useful to contain oil that melts out during breakup.

A snow berm is built around the areas of heaviest oiling to contain oil or diesel spilled to tundra and/or ice in winter. A bulldozer drives around the spill with its blade angled towards the spill, pushing snow into a berm. Once the perimeter has been covered with an initial berm, the dozer shores up areas, as necessary.

A front-end loader could also be used to build a berm, and a Bobcat can be used to access areas the large front-end loader or dozer cannot reach.

FIGURE 4-2 SNOW BERMING



Deployment Considerations

- This tactic is appropriate for use with low flow and shallow water on pad or tundra. The least intrusive methods for building berms are preferred on tundra.
- Do not excavate where excavation will cause more damage than the spill.
- Before excavating in tundra, check for the presence of groundwater or permafrost. Do not excavate into frost-laden (cemented) soils, since disruption of the permafrost could accelerate thermal erosion. The depth of the trench is limited by the depth of the permafrost. A plastic liner or sheeting can be used on the walls of the soil or gravel berm to inhibit spill penetration into the soils or gravel.
- Approval from the Operations Section Chief is required for any vehicle tundra travel (offroad or off-pad), which must be in accordance with Alyeska's emergency tundra travel permit. Any excavations in tundra or any tundra damage must be reported to the Operations Section Chief. All on-tundra activity must be documented and reported to the Field Environmental Generalist for reporting to ensure permit compliance. Avoid archeological sites and biologically sensitive habitats. Travel across tundra with tracked vehicles, heavy equipment, and even foot traffic can seriously damage the vegetative mat, induce thermokarst, and cause structure disturbance. Using sheets of plywood as a traveling surface and minimizing trips with equipment greatly reduce disturbance of the tundra.

FIGURE 4-3 CONTAINMENT BARRIERS

Deployment Considerations (Continued)

A containment berm can be constructed of available materials such as earth, gravel, or snow. Use earth-moving equipment or manual labor to construct the berm. Form the materials into a horseshoe shape ahead of the flow of oil. Use plastic sheeting to line the walls of a soil berm to prevent oil penetration. Because of the sorbent quality of snow, it makes an excellent berm for both containment and recovery. A snow berm can be strengthened by spraying it with a fine water mist that forms an ice layer on top of the snow. Sandbags filled with sand or other heavy material also make excellent containment barriers.

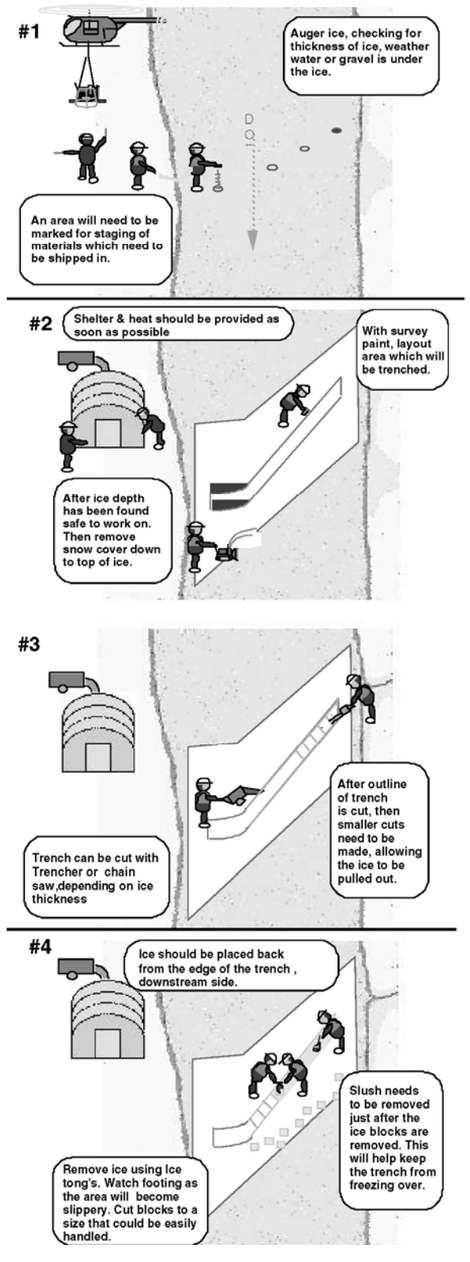
Sorbent boom can be used when overland flows are relatively minor or in wetlands. The sorbent boom should be staked in place with stakes approximately 5 feet apart.

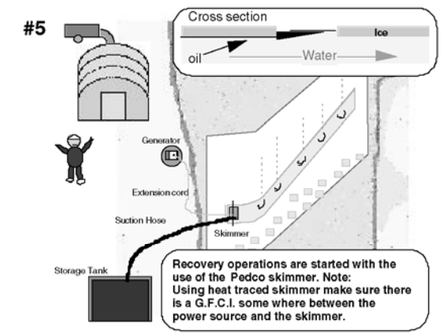
These barriers can serve to:

- Contain and stabilize a contaminated area
- Contain or divert oil on water or oil that has potential to migrate
- Create cells for recovery
- Block natural depressions to act as containment areas for recovery

An excavated trench or a berm on the tundra can also be used to intercept the flow of a spill or divert the flow around a sensitive area. Dig the trench at right angles to the flow of the spill. The trench should be angled slightly downslope (in the direction of surface flow) to avoid excessive pooling in the trench. Place excavated material on the downhill side of the trench. In areas with a low water table, line the sides and bottom of the trench with plastic sheeting or similar impermeable materials. Where the groundwater table is high, line the downhill side of the trench. The trench can be flooded with water to inhibit spill penetration into sediments and to stimulate flow toward the recovery device in the trench or pit.

FIGURE 4-3 CONTAINMENT BARRIERS (CONTINUED)





#6 *Wind Speed Chart*

WIND Speed		*Temperature (°F)*														
KNOTS	*MPH*	*30*	*25*	*20*	*15*	*10*	*5*	*0*	*-5*	*-10*	*-15*	*-20*	*-25*	*-30*	*-35*	*-40*	*-45*
3-6	*5*	*25*	*20*	*15*	*10*	*5*	*0*	*-5*	*-10*	*-15*	*-20*	*-25*	*-30*	*-35*	*-40*	*-45*	*-50*
7-10	*10*	*15*	*10*	*5*	*0*	*-10*	*-15*	*-20*	*-25*	*-35*	*-40*	*-45*	*-50*	*-60*	*-65*	*-70*	*-75*
11-15	*15*	*10*	*0*	*-5*	*-10*	*-20*	*-25*	*-30*	*-40*	*-45*	*-50*	*-60*	*-65*	*-70*	*-80*	*-85*	*-90*
16-19	*20*	*5*	*0*	*-10*	*-15*	*-25*	*-30*	*-35*	*-45*	*-50*	*-60*	*-65*	*-75*	*-80*	*-85*	*-95*	*-100*
20-23	*25*	*0*	*-5*	*-15*	*-20*	*-30*	*-35*	*-45*	*-50*	*-60*	*-65*	*-75*	*-80*	*-90*	*-95*	*-105*	*-110*
24-28	*30*	*0*	*-10*	*-20*	*-25*	*-30*	*-40*	*-50*	*-55*	*-65*	*-70*	*-80*	*-85*	*-95*	*-100*	*-110*	*-115*
29-32	*35*	*-5*	*-10*	*-20*	*-30*	*-35*	*-40*	*-50*	*-60*	*-65*	*-75*	*-80*	*-90*	*-100*	*-105*	*-115*	*-120*
33-36	*40*	*-5*	*-15*	*-20*	*-30*	*-35*	*-45*	*-55*	*-60*	*-70*	*-75*	*-85*	*-95*	*-100*	*-110*	*-115*	*-125*
Winds Above 40 Have Little Effect		***Little Danger***			***Increasing Danger*** *Flesh May Freeze Within 1 Minute*						***Great Danger*** *Flesh May Freeze Within 30 Seconds*						
Danger of Freezing Exposed Flesh for Properly Clothed																	

FIGURE 4-4 ICE TRENCHING

Ice Trenching Steps

1. Determine depth and location of water. Depending on the depth and speed of the water and thickness of the ice, individuals may need to wear personal flotation devices (PFDs) and be roped off.
2. Remove snow in immediate area of proposed trench. Mark area to be cut out using surveyor's paint, rope, or a shallow line cut with a chain saw.
3. Cut out twin parallel lines running across stream first (angle of trench should be approximately 30° perpendicular from bank to bank); depending on ice thickness, a mobile trencher or chain saw can be used. Small ice blocks can be cut out using a chain saw. Cut blocks to a size that can be handled easily.
4. Use ice tongs located in ice pallet to lift blocks out of trench. Place ice blocks downstream and out of the way of the activities around the trench. Remove slush from the trench after blocks are removed.
5. After equipment is set up, recovery operations can be started.
6. Wind Speed Chart: Cooling power of wind expressed as "Equivalent Chill Temperature."

FIGURE 4-4 ICE TRENCHING (CONTINUED)

Equipment	Gross Weight	Min. Ice Thickness
Person	200	2.5"
Crewcab	5909	12"
760 Trencher	9480	13"
Tucker	10,110	14"
450 JD	14,540	17"
D6H w/ S-blade	39,075	30"
966F	45,500	33"
14 G	45,550	33"
D7G w/ S-blade	45,560	33"
Dump Trk.	59,000	35"
980F	60,654	35"
Vac Trk. 100 bbl.	67,000	36"
D8N w/ U-Blade	81,222	40"
D9N w/ U-Blade	93,789	43"
235D	103,780	45"
245D	150,520	55"

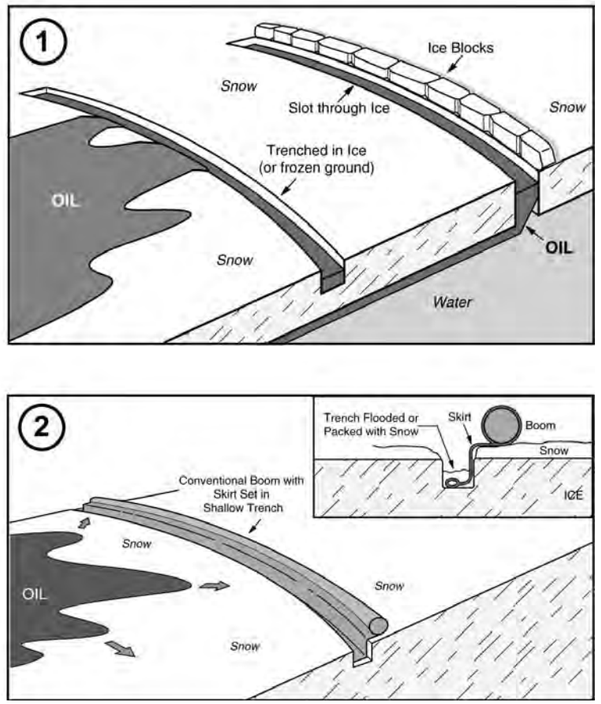
Notes

- White ice is only 1/2 as effective as blue ice.
- If cracks are parallel to travel, reduce load by 1/2.
- If cracks are both perpendicular and normal to travel, reduce load by 3/4.
- Use extreme care if weather becomes extremely cold after warm period or warm after cold period.
- Control speed in shallow water to avoid wave buildup.
- Reduce load by 1/2 for young sea ice.

Deployment Considerations

Check ice thickness for safe bearing capacity before working on ice. The ice must be sufficiently strong to support personnel and heavy equipment. Also, ensure ice can withstand extra load of oil and ice on the surface without either breaking the ice or forcing oil to migrate through existing cracks. Extreme care must be taken when positioning or operating any heavy equipment close to trenches or slots in the ice. Stresses in the ice for a given load can double under these situations. Ensure that oil that accumulates in an ice trench is continually removed. If allowed to build up to a thick layer, some oil may escape the ice slot.

FIGURE 4-5 FRESHWATER ICE BEARING CAPACITY



Various techniques that are used on land can also be used on solid ice.

- Partial trenches or through-ice slots can be dug in the ice surface with a Ditch Witch to encourage oil flow to a collection point.
- The skirt of a containment boom can be set in a shallow trench to provide additional containment.
- Another approach is to insert a plywood or metal barrier in a slot so that the barrier freezes in place. This tactic can be used to divert under-ice oil to a recovery point.

For smaller volumes of oil on ice, small snow berms can be created to contain the oil, but only where ice is thick enough and/or grounded to prevent cracking, pooling, and forced migration of oil below the ice.

Oil moving both on the surface of ice and underneath it can be concentrated in slots cut in the ice and recovered by skimming with rope mops or other types of skimmers. If the oil in the slot is thick enough, it can be removed using weir skimmers or direct suction.

Oil entrained in subsurface pockets can be reached by drilling holes with ice augers and pumping the oil directly to storage containers such as drums or bladders. Temporary storage can also be provided by excavating shallow pits in the ice surface using chain saws and chipper bars. These oil concentrations can be pumped off or burned.

FIGURE 4-6 ICE TRENCHING AND CUTTING ICE SLOTS

Booming Methodology

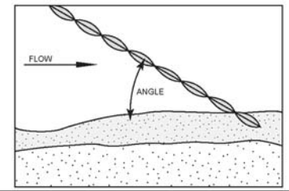
1. Establish containment and recovery areas. (Known recovery areas are referenced in the containment instructions in Section 4 of this volume.) Good access by both ground and air is a priority.
2. Determine normal current velocity of river/stream.
3. Determine depth and width of river/stream.
4. Based on current velocity and river/stream width, determine the following:
   - Amount of boom required
   - Angle of deployment
5. Establish anchor points for tying off boom:
   - Number of anchors needed (upstream, downstream, tagline)
   - Amount of rope needed per anchor point
6. When occasion arises, deploy boom as follows:
   - Position boom along river edge on deployment side of river/stream.
   - Tie off boom at appropriate anchors on boom deployment side of river/stream.
   - Tie off (using boat for transportation) anchor and tag lines at designated points along boom length.
   - Pull and secure anchor lines and tag lines to designated anchors on recovery side of river/stream (depending on river width and current velocity, there may be several anchor points).
   - Pull and adjust anchor and tag lines, as required, on opposite bank.
   - Upon completion, ensure that spilled product will slide down boom length and will collect in recovery area.
   - If necessary, direct oil into recovery device (skimmer) using cold water hose wash.
   - If necessary, adjust anchor lines to position boom in as straight a line as possible.

Boom Deployment Considerations

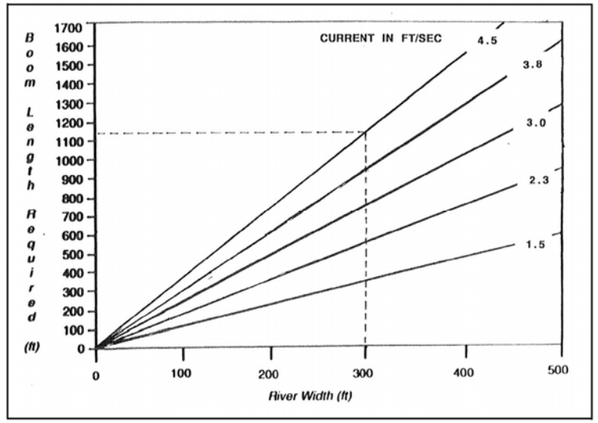
- The optimum angle of boom deployment depends on the current speed and the length and type of boom. The angle is smaller in strong currents than in weak currents, and decreases as boom length increases. The more stable the boom is, the larger the optimum deployment angle is for a given current speed. Because deflection booms significantly reduce surface current, successive booms are deployed at increasingly larger angles.
- Don't assume 100% containment with one boom system.
- Readjust angles and widths between boom sections as current and wind change. Constantly monitor nearshore boom systems to prevent escape of oil.

FIGURE 4-7 BOOMING METHODOLOGY

CURRENT (knots)	CURRENT (ft/second)	BOOM ANGLE RELATIVE TO CURRENT REQUIRED TO KEEP COMPONENT OF CURRENT < 1.2 KNOTS
1.5	2.5	30° to 42°
1.75	2.9	25° to 35°
2.0	3.4	22° to 30°
2.25	3.8	19° to 26°
2.5	4.2	17° to 24°
2.75	4.6	16° to 21°
3.0	5.0	15° to 19°

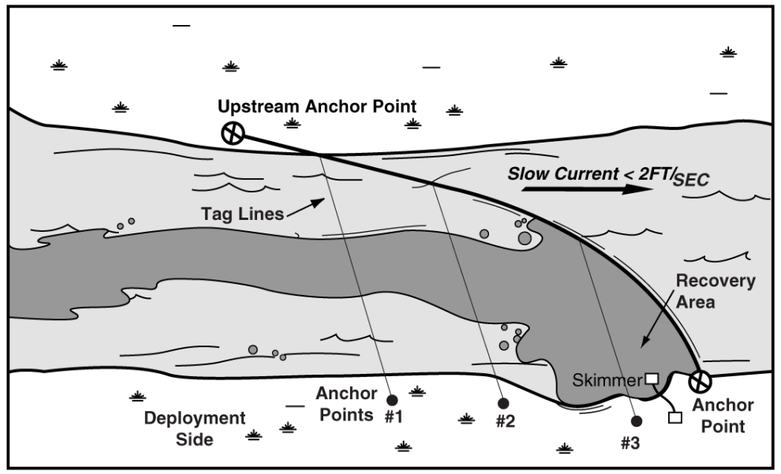


Boom Angle Determination

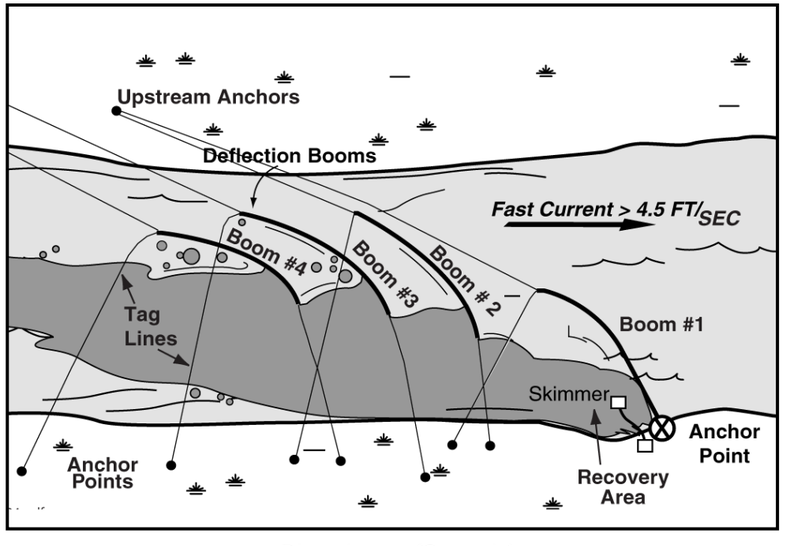


Boom Length Determination

FIGURE 4-7 BOOMING METHODOLOGY (CONTINUED)



Deflection/Diversionary (Single Boom)



Diversionary (Cascade)

FIGURE 4-8 DEFLECTION/DIVERSIONARY BOOMING

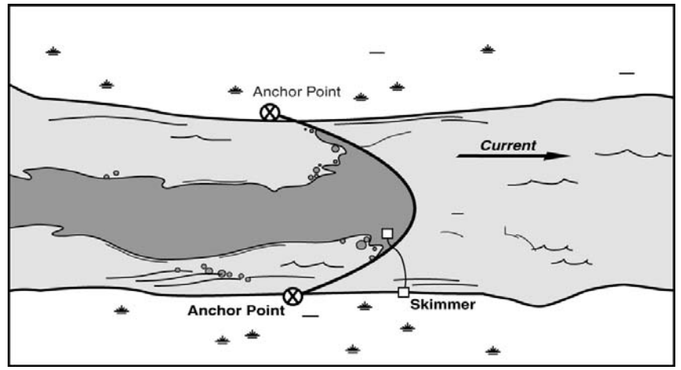
Deployment Considerations

The object of stream booming is to remove oil from the fastest water and divert it to slower water. A stream can be boomed by deploying the boom either upstream or downstream. In either case, the boom is first set out on the stream bank. Before the boom is deployed, rig anchor points on the boom. The boom is attached to a shore anchor, and then the boom is either towed upstream to a midstream anchor point, or the boom is allowed to drift downstream with the current. Once the boom is set, intermediate anchors are set as needed to ensure that the boom maintains the proper configuration (remembering that the current perpendicular to the boom should not exceed 1.2 knots). Examples of deployment configurations follow.

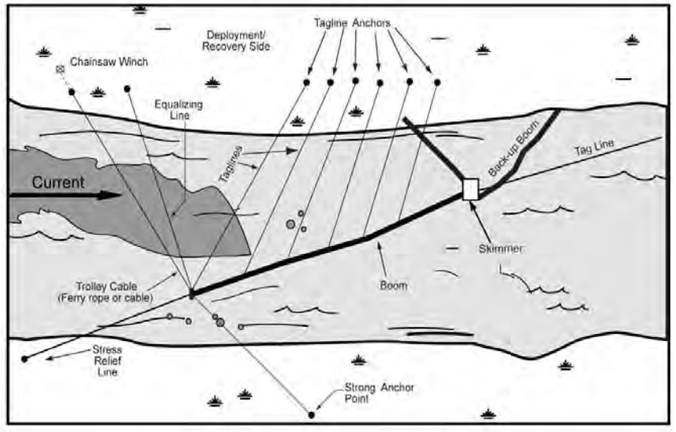
- **Diversionary (single boom):** A boom is deployed from one bank at an angle to the current and anchored midstream or on the opposite bank for diverting the oil to an eddy or other quiet-water collection point on the shoreline. Alternatively, a single long boom can be used in a multichannel stream to divert oil so that it stays in one channel.
- **Diversionary (cascade):** Several booms are deployed in a cascade fashion when a single boom can't be used because of a fast current. This configuration can be used in strong currents where it is impossible or difficult to deploy one long boom. Shorter sections of boom used in a cascade deployment are easier to handle in fast water. However, more equipment is needed than when a single boom is used.
- Since the speed of the current perpendicular to the boom must be maintained at 1.2 knots or less, the length of boom needed to stretch across a stream depends on the current. For a stream 100 feet across with a 1 knot current, a boom approximately 140 feet long is needed. If the current is 2 knots, the same stream would require 320 ft of boom. The speed of the current is not equal across the stream; the fastest water occurs at the deepest point. Oil moving in a stream will be entrained in the fastest water.
- Don't assume 100% containment with one boom system.

Readjust angles and widths between boom sections as current and wind change. Constantly monitor nearshore boom systems to prevent escape of oil.

FIGURE 4-8 DEFLECTION/DIVERSIONARY BOOMING (CONTINUED)



Catenary

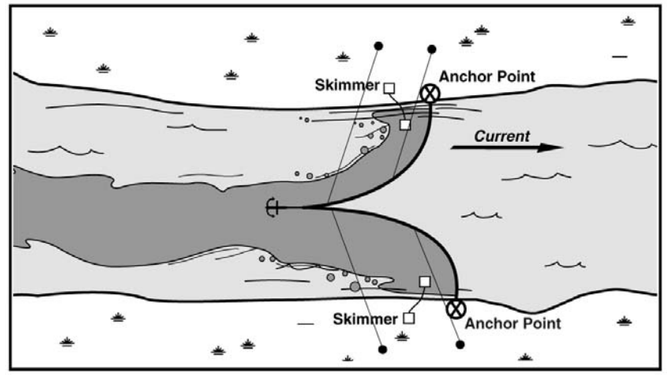


Trolley

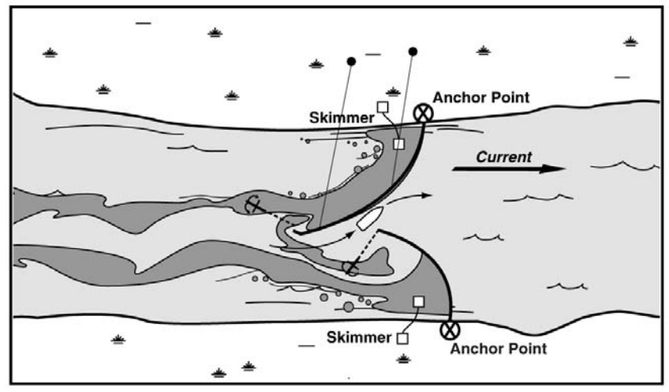
Deployment Considerations

- **Catenary (currents less than 1/4 knot):** The boom is attached to an anchor on one bank, and the other end is towed to the other bank and attached to an anchor there. The current naturally puts the boom in a “U” shape (catenary). The deployment and maintenance of a single long boom can be difficult and labor-intensive. It is usually used for recovery operations.
- **Trolley (cable-supported diversionary boom):** A cable or line is strung across a river and the boom attached to the trolley line with a pulley. The advantage of a trolley boom system is that its opening may be adjusted based on changing river conditions and that deployment and recovery can be accomplished from the same stream bank. It may be used in fast or slow water, based on the adjustment of the boom angle.
- A safety consideration is that the cable/line extends across the stream channel. Up- and down-river buoy signs should be posted to alert boat traffic of the potential hazard.

FIGURE 4-9 CATENARY AND DEFLECTION/TROLLEY BOOMING



Closed Chevron

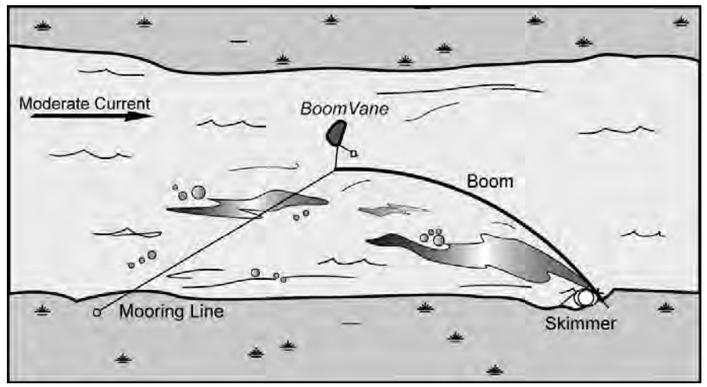


Open Chevron

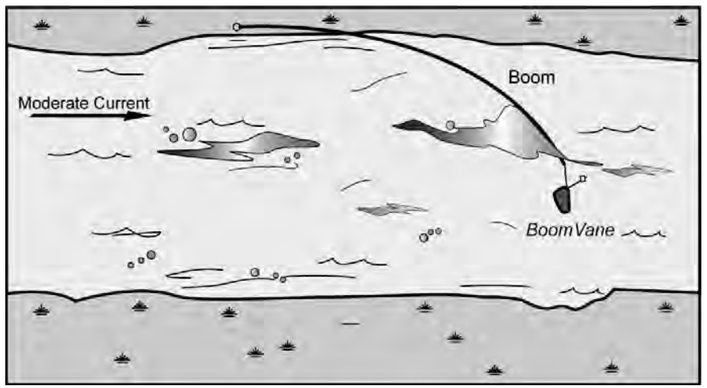
Deployment Considerations

- Chevron boom configurations are also for use in fast water. Two booms are deployed from an anchor in the middle of the stream and attached to each bank. A chevron configuration is used to break a slick for diversion to two or more collection areas. An open chevron can be used where boat traffic must be able to pass. (The two booms are anchored separately midstream, with one anchor point upstream or downstream of the other).
- Since the speed of the current perpendicular to the boom must be maintained at 1.2 knots or less, the length of boom needed to stretch across a stream depends on the current.
- Readjust angles and widths between boom sections as current and wind change. Constantly monitor nearshore boom systems to prevent escape of oil.

FIGURE 4-10 CHEVRON BOOMING



Recovery Mode



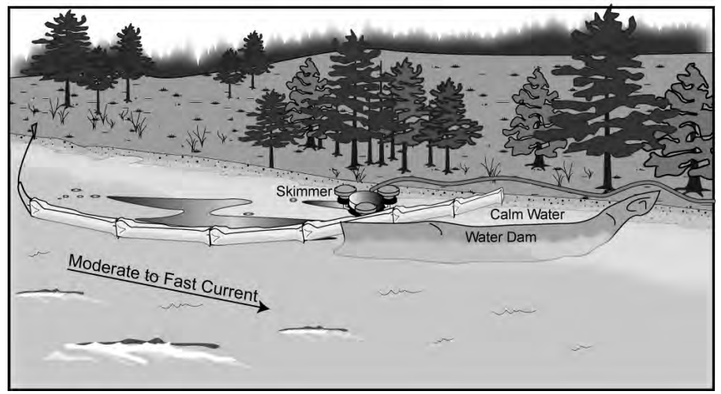
Deflection/Exclusion Mode

Deployment Considerations

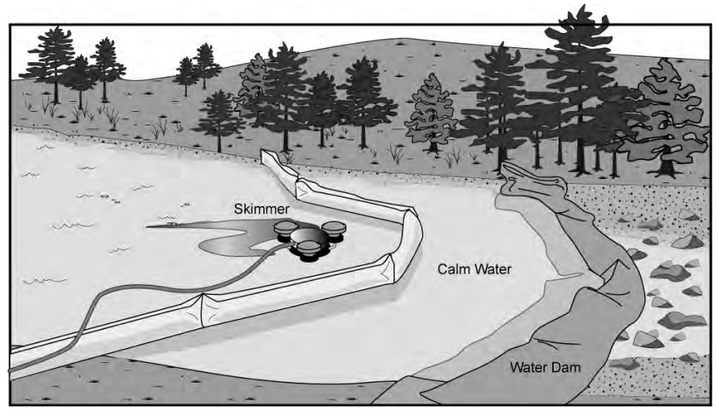
Boom vanes can be deployed to replace the need for mid-stream anchor systems when setting boom in a stream either to create a recovery area for a skimmer (top) or to help deflect oil from a sensitive shoreline location (bottom).

Multiple boom-vane systems can be deployed together to deflect and recover oil on wide rivers.

FIGURE 4-11 USE OF BOOM VANE FOR RECOVERY OR DEFLECTION



Collection Mode, Open to Mid-Stream

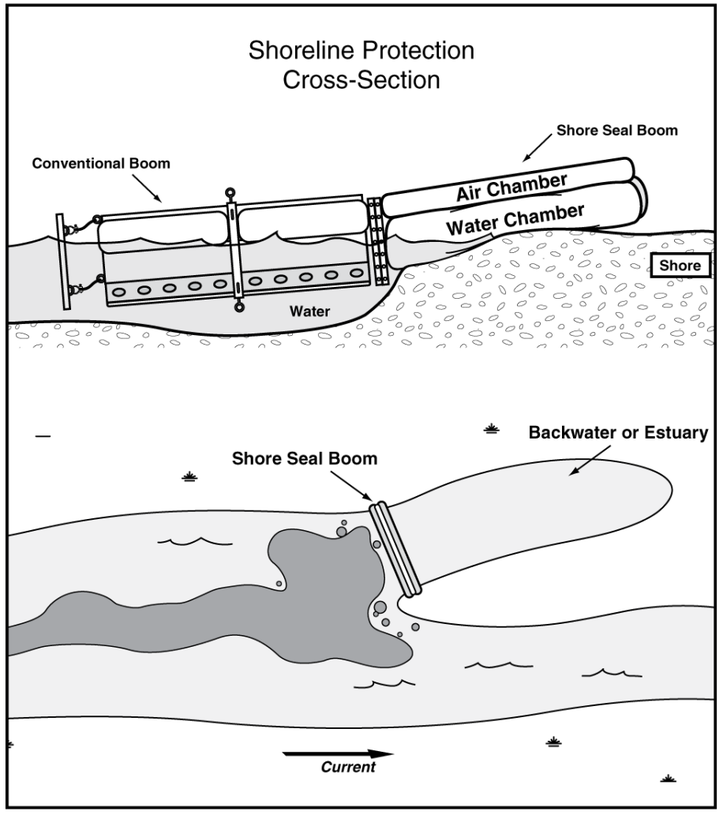


Collection Mode, Bank to Bank

Deployment Considerations

The MegaSecur water dam can be deployed to dam a shallow stream from bank to bank to hold back enough water to create a deeper, calm-water area where a containment boom and skimmer can be deployed (top). The dam can also be used to create calm water with and open end in a stream which is shallow near the shore (bottom). A deeper-water area develops where boom and skimmer systems can be deployed. In fast current, the MegaSecur dam's mid-stream end may have to be secured to the streambed.

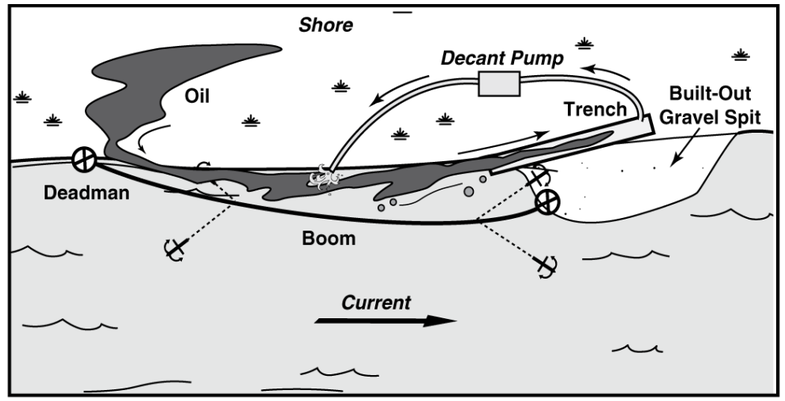
FIGURE 4-12 USE OF MEGASECUR WATER DAM



Deployment Considerations

- Either conventional boom or a Shore Seal boom can be used to exclude oil from a sensitive area. For example, the Shore Seal boom can be used in shallow water to boom off a backwater, or a conventional boom can be placed across the mouth of a side channel to keep oil out. In addition, Shore Seal boom can be connected to conventional boom to protect the shoreline and make a tight seal to prevent entrainment.
- Before filling the bottom chamber with water, ensure proper placement of shore sealboom because of the heavy weight and difficulty repositioning when full.

FIGURE 4-13 EXCLUSION BOOMING



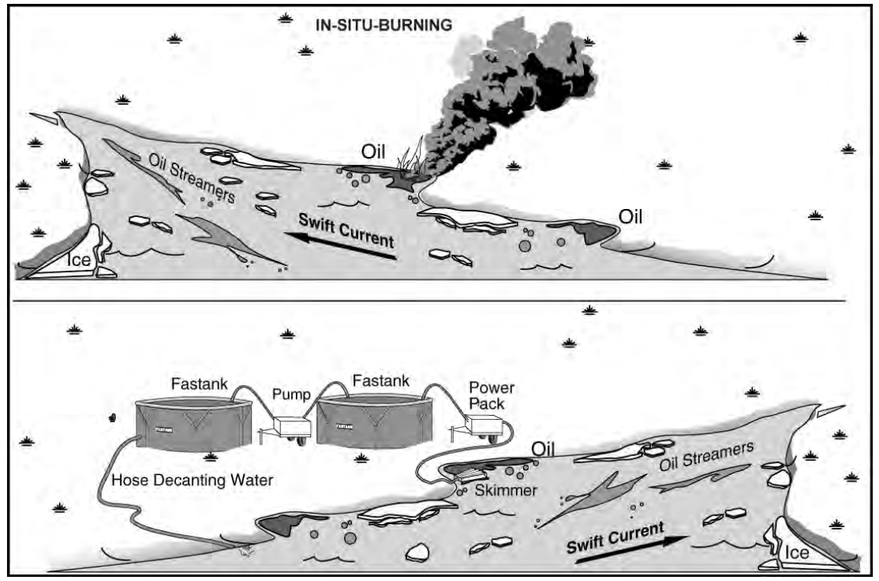
Deployment Considerations

A natural or man-made deadarm trench can be used along the bank of a river to keep oil from migrating downstream from a spill on land. The deadarm will serve as a control point downstream of where the oil is entering the river. Deflection boom is deployed to help divert the oil into the deadarm, which may be lined with an impermeable liner.

Also, the entry of oil at the mouth of the deadarm can be controlled with an adjustable weir.

- The angle of the trench to current is important. Keep the current perpendicular to the boom at 1.2 knots or less.
- Oil will follow current along the shore.
- A Title 41 permit from the Alaska Department of Natural Resources is required when digging trenches in river beds and river banks.
- Readjust angles and widths between boom sections as current and wind change. Constantly monitor nearshore boom systems to prevent escape of oil.

FIGURE 4-14 DEADARM TRENCH ON RIVER BANK



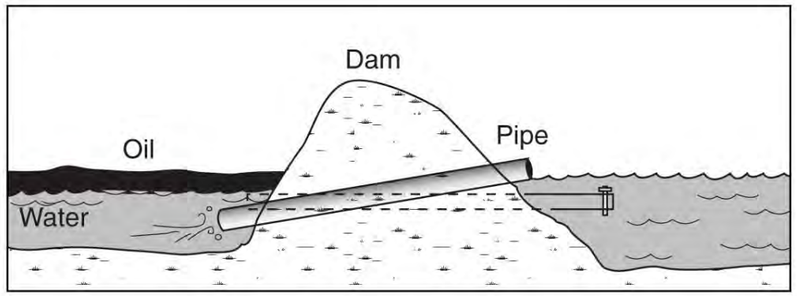
Deployment Considerations

Tactical options are limited during the aggressive river breakup period when currents are strong from bank to bank, large pieces of ice are flowing in the river, and it is not safe to deploy airboats or other vessels. Personnel will not be placed at risk to deploy any containment or recovery equipment in the river channel.

The overall strategy is to go downstream from the point where the spill is entering the water to look for mechanical recovery or burn opportunities in quiet-water areas along the stream banks where boom could be deployed. The Heli-torch can be used to ignite inaccessible oil pockets, while skimmers and pumps or vacuum trucks can be used where road access is available. In-situ-burning requires a burn permit. Consult with Field Environmental Generalists prior to any burning operation.

- Oil will tend to be naturally dispersed by the water's turbulence and by adherence to silt and sinking.
- Two trained personnel are needed to mix gelled fuel for the Heli-torch and to attach it to the helicopter.
- A batch mixer can be used for mixing large amounts of gelled fuel for Heli-torch.

FIGURE 4-15 IN-SITU BURNING



Deployment Considerations

An underflow dam can be used when there is too much water flow to allow for a complete blockage of a drainage channel. The dam is built of earth, gravel, or other barriers such as sandbags. Wherever possible, line the upstream side of the dam with plastic sheeting to prevent erosion and penetration of oil into the dam material.

Underflow dams use inclined pipes to move water downstream while leaving the spill contained behind the dam. The capacity of the pipe (or pipes) should exceed the stream flow rate. It may be necessary to use pumps.

Pipes must be placed on the upstream side of the dam, with the elevated end on the downstream side. Make sure that the upstream end of the pipe is submerged and below the oil/water interface. The height of the elevated downstream end of the pipe will determine the water level behind the dam.

- Check dams periodically for leakage and integrity, replace eroded materials, and continually monitor the water/oil interface. Valved pipes, pumps, or number of siphons may require periodic adjustment to compensate for minor changes in stream flow.
- If sufficient underflow cannot be maintained, or if excessive overflow occurs, additional dams downstream may be required.
- If erosion is a problem, gravel or topping may have to be added continually to the dam.
- Approval of State On-Scene Coordinator and Alaska Department of Natural Resources (ADNR) is necessary for civil work in anadromous fish streams, as well as a Title 41 permit from ADNR.
- Damming of stream mouth may block fish passage. The dam must be removed immediately after it is no longer needed.

FIGURE 4-16 UNDERFLOW DAM

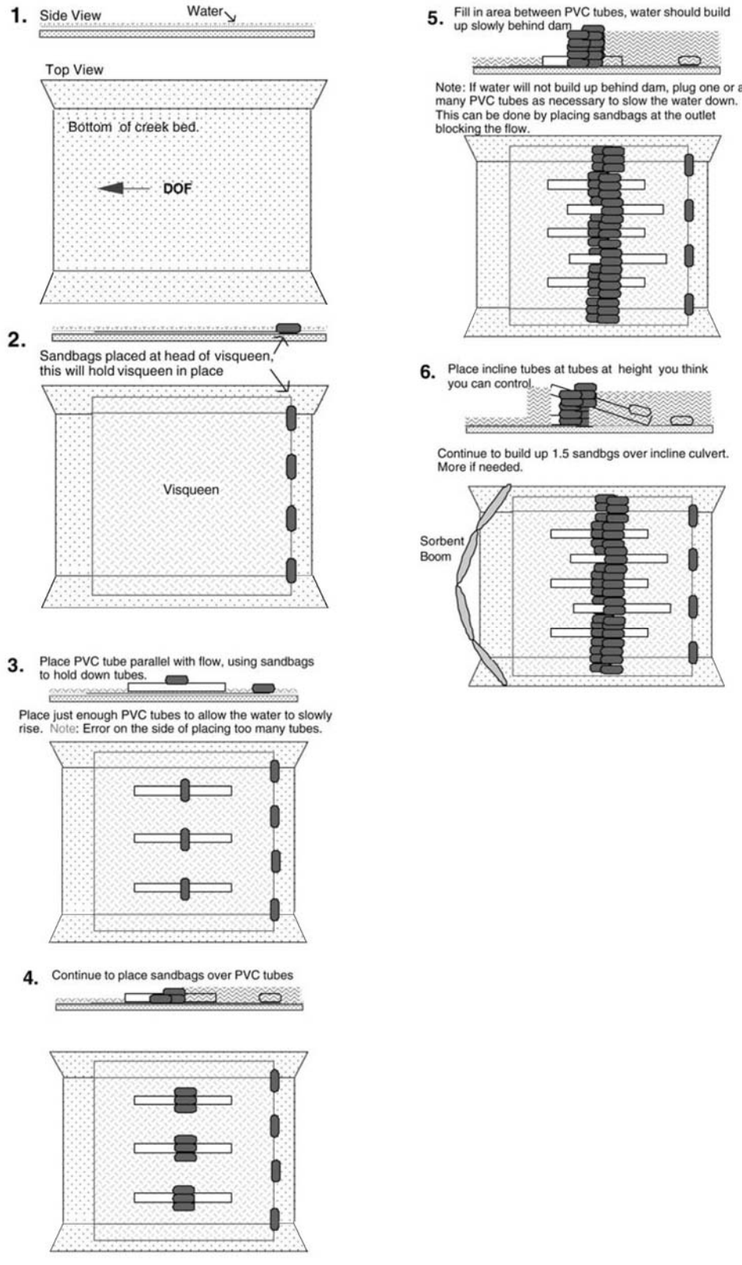


FIGURE 4-17 INCLINED CULVERT

Inclined Culvert Steps

1. Site selected to install incline culvert dam, underflow dam, or both, should have:
   - Enough time to allow construction of structure before leading edge arrives
   - Fairly steep banks or slopes; keep in mind the need for secure footing
   - Ideally smooth gravel or a sandy bottom in the creek bed (works best)

   Care needs to be taken around rough slopes.

2. Lay Visqueen down upstream of dam. Anchor upstream edge of Visqueen with sandbags. Water will start passing over and sink the Visqueen to the bottom of the creek.

   Note: Lay the Visqueen to keep material from being dredged from bottom of creek bed. With Visqueen, creek clears up fast.

3. Start placing culverts or PVC tubes parallel with flow of water midway on the Visqueen. Hold tubes down with sandbags.

   Note: Err on the side of placing too many tubes. Once the dam is built, it is impossible to add more tubes.

4. After sandbags have been placed to hold tubes down, start filling the area between each tube with sandbags. Water will start rising and running over the top of the sandbags.

5. Continue stacking sandbags on top of each other to form a wall. Each row continues from creek-bank to creek-bank.

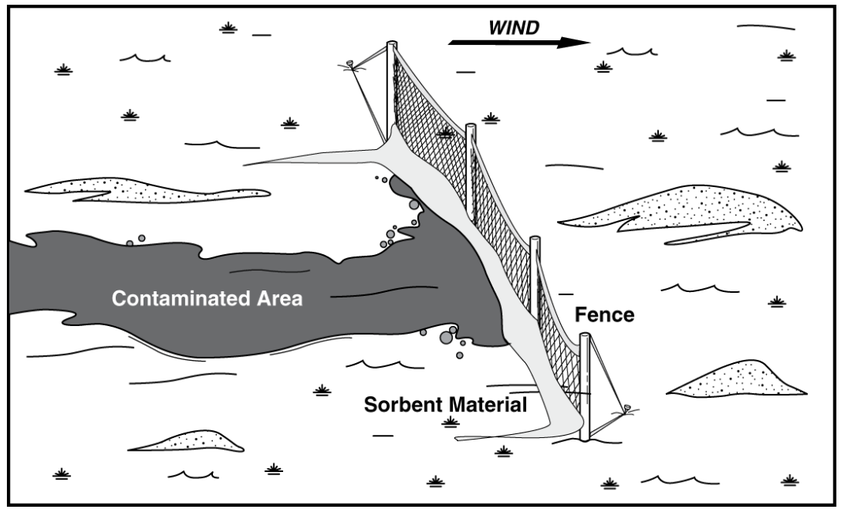
   Note: As sandbags are placed, note the rise in water upstream of the tubes. Water should rise slowly. If water doesn't rise, then block the intake or outlet of one or more tubes. Then, if the creek should rise because of rain, the tubes could be unplugged to handle the increase in water volume.

6. When a height of 2.5 to 3 feet has been reached, additional tubes should be placed in the incline position. Place at least 2 more rows of sandbags on top of the dam. The level of the water should maintain the same height as the outlet of the incline tube.

   Note: It's common for a whirlpool to form above the intake of the incline tube. It pulls any type of product, normally skimmed off the top and down through the tubes, out and into the containment area. The further the incline tube intake is from the water surface, the less likely it is to happen.

As a precaution, string a section of sorbent boom downstream of dam.

FIGURE 4-17 INCLINED CULVERT (CONTINUED)



Deployment Considerations

- Sorbents work well on fresh crude, light refined oils, and thick sheens, but are only partially effective on solidified or weathered oil, highly viscous oil, very thin sheens, or emulsified oil. Sorbent products are ineffective unless all layers become saturated when in contact with spilled product. Use sorbent boom when overland flow is minor, and terrain has low slope or is wetland.

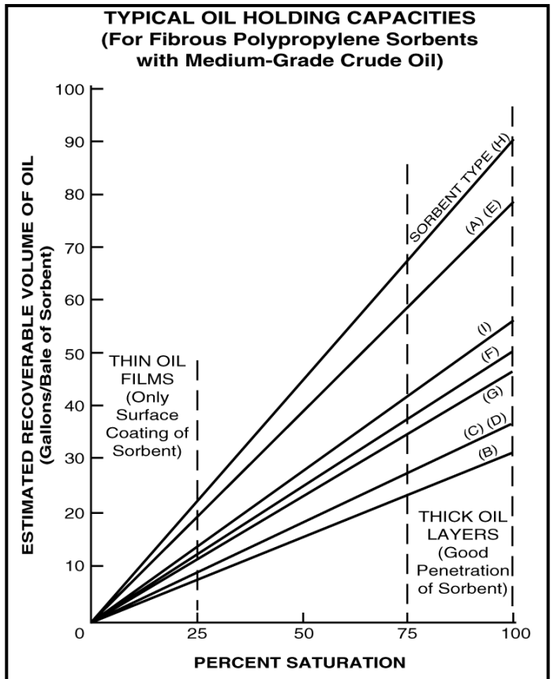
Sorbent pads and rolls can be used onshore to remove small pools of liquid or oil layers on rocks or man-made structures. If the spill is at the shoreline, sorbent boom can be deployed and backed up with conventional containment boom as necessary to keep the oil from drifting away.

Sorbents can be used with Shore Seal boom or fences to create an oil absorbent barrier.

Place oiled sorbents in plastic bags marked oily waste for removal and disposal. Larger quantities can be placed in barrels or debris boxes.

Minimize the amount of sorbent material used. Oily sorbent bags must be placed in oily waste dumpsters.

FIGURE 4-18 USING A SORBENT FENCE



NOTE: Assume one-time use and 15:1 (oil to sorbent by weight) ratio, or approximately 2-gal/lb of sorbent."Ratio of oil weight to sorbent weight at saturation may be as low as 10:1 for light oils (e.g., avgas, JP-4, and gasoline) and greater than 20:1 for heavy lube oils and Bunker C.

Sorbent Use: Typical Oil Holding Capacities

COMMON SORBENT PACKAGING CHARACTERISTICS
(For Fibrous Polypropylene Products)

Sorbent Type	Dimensions	Units/Bale	Approximate Weight (Pounds/Bale)
(A) Rolls	3/8" x 36" x 150'	1 Roll	38
(B) Sweeps	3/8" x 19" x 100'	1 Sweep	15
(C) Sheets	3/16" x 18" x 18"	200 Sheets	18
(D) Sheets	3/8" x 18" x 18"	100 Sheets	18
(E) Sheets	3/8" x 36" x 36"	50 Sheets	38
(F) Particulate	—	1 Bag	25
(G) Pillows	5" x 14" x 25"	10 Pillows	23
(H) Booms	8" Diam. x 10' Long	4 Booms	44
(I) Double Booms	5" Diam. x 10' Long	4 Double Booms	28

Sorbent Use: Common Packaging Characteristics

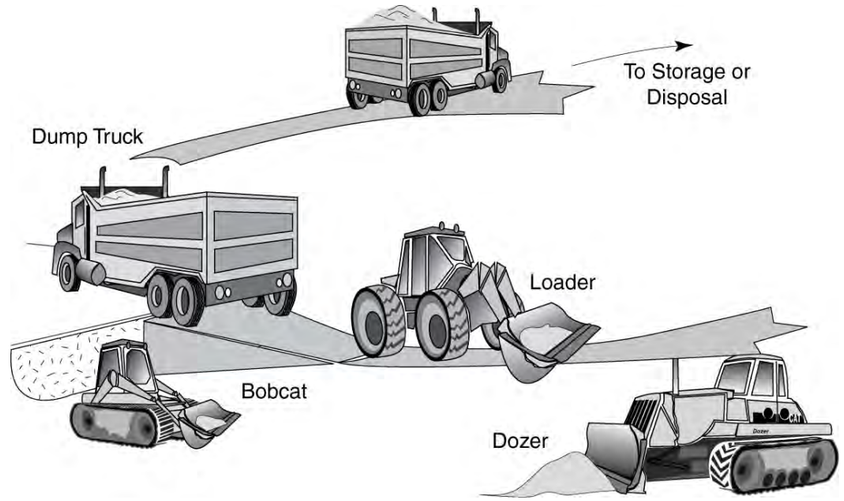
FIGURE 4-19 SORBENT USE

Deployment Considerations

- This tactic is limited to oiled snow with no free liquids.
- When working with equipment around or near aboveground pipelines, add a spotter to each front-end loader and dozer.
- Manual recovery is the preferred technique when working in tight areas, when the ground is too rough for equipment, or there is insufficient snow cover for equipment.
- The number of crews on the spill depends on the size of the spill.
- The lightly oiled snow may be blended with heavily oiled snow in the area.
- Snowmelters typically handle 30 cubic yards of lightly oiled snow per hour, providing 30 barrels/hour of water, plus the oil.
- Warm-up areas are needed for responders.

Broom and shovel the oiled snow into piles. The piles are then transferred with shovels to garbage cans, totes, or similar containers. Once a container is full, it is transferred with a snow machine or Snow Cat with sled to a front-end loader near the gravel pad or road. The loader then transfers the snow into dump trucks on the pad or road.

FIGURE 4-20 MANUAL RECOVERY OF OILED SNOW



Deployment Considerations

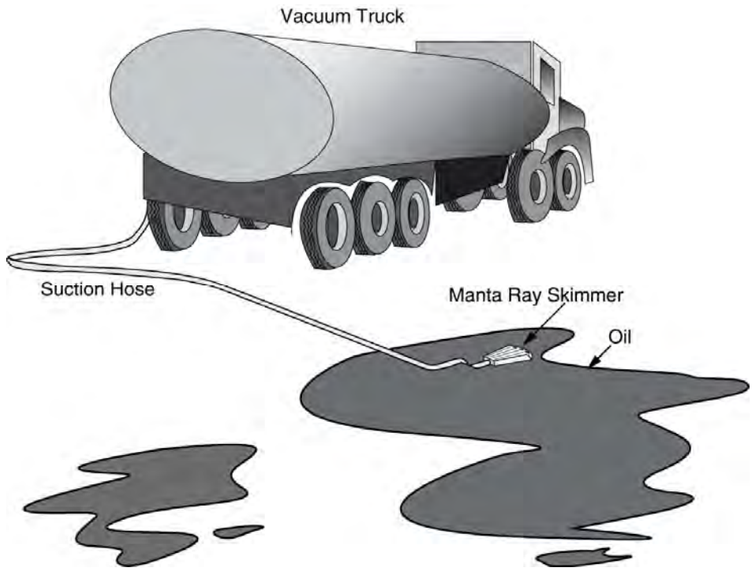
- This tactic is limited to oiled snow with no free liquids. Otherwise, lined or leak-proof dump trucks may be used.
- If the oiled snow is too saturated for handling, blend lightly oiled snow or clean snow with it.
- If delivery of snow exceeds snowmelter capacity, the snow can be contained in lined pits until it is processed. When available, existing lined pits, upright tanks, or dry ponds can be used to store snow; otherwise, temporary lined pits can be constructed as necessary.
- If dump trucks cannot access the oiled area, build an ice road to limit loader travel.
- After removal of free oil and oiled snow, and after flushing, contain and monitor the area until breakup. Insulate ice roads or ice berms to provide containment during breakup, when the oil can be removed with direct suction, portable skimmers, or burning.

Snow provides a good sorbent material for oil and forms a mulch-like mixture that is easily removed with heavy equipment such as front-end loaders and dump trucks. A Bobcat replaces the front-end loader in hard-to-reach or tight quarters.

Access the oiled snow with dozers and loaders, pile the snow with the dozers, and then load it into dump trucks located on nearby gravel pads, roads, or ice roads. After a front-end loader has filled a truck, the truck hauls the oiled snow off for disposal, typically to snowmelters in lined pits. If heavily oiled snow requires blending to ease recovery, loaders and dozers push nearby lightly oiled snow into the heavily oiled snow area for recovery. Clean snow can also be used for blending.

Oil in areas inaccessible by vacuum trucks or heavy equipment is recovered with sorbents and manual labor. The sorbents are collected in totes, garbage cans, or bags and transferred with snow machine, Snow Cat, or pickup truck to a front-end loader, which transfers the waste into a dump truck for removal and disposal. Sorbents must be placed in oily waste bags and then put in an oily waste container.

FIGURE 4-21 MECHANICAL RECOVERY OF OILED SNOW



Deployment Considerations

- Vacuum trucks provide efficient spill recovery, unless vehicle access is prohibited or not possible, the spill is unpumpable (highly viscous, cold or weathered), the spill is in a thin layer, or debris will clog the recovery line.
- Identify the disposal facility to be used before calling out a vacuum truck.
- Viscous liquids accessible within 200 feet by a vacuum truck are recovered with direct suction of that vacuum truck. Access could be made available to areas in the winter with ice roads. Pooled areas could be in natural depressions or in constructed trenches.
- Vacuum trucks can access pooled diesel up to 400 feet away from the truck.
- Use of Manta Ray skimmers with vacuum trucks decreases recovery capacity.

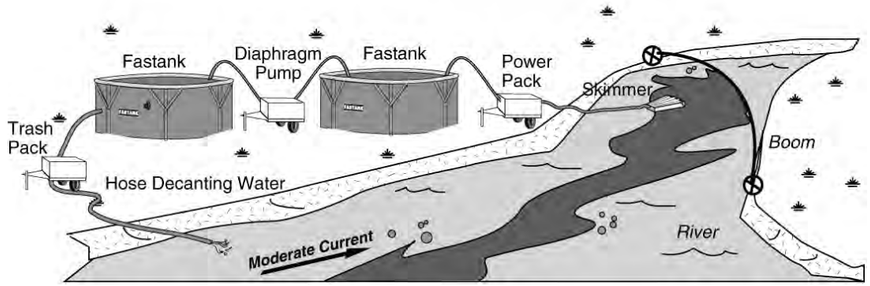
For spills off pad or road, a vacuum truck can effectively reach out 200 feet. If the oil is pooled on water, a Manta Ray skimmer head is attached to the hose extending from the vacuum truck. The hose or skimmer head is placed in the pooled oil for recovery. Response personnel man the hose or skimmer head and move it to other pooled areas as necessary.

Four-inch trash pumps can be used for this task since they can move oil more than 200 feet, and could either pump the pooled oil into vacuum trucks on a pad/road, into holding tanks, or into the oil tank at a nearby pump station.

Free oil can be recovered from any pooled area including natural depressions, barriers, constructed trenches, or containment dikes.

FIGURE 4-22 RECOVERY BY DIRECT SUCTION

NOTE: This illustration depicts a typical deployment for this tactic.



Deployment Considerations

When oil is being skimmed from the water surface, it is likely that considerable volumes of water will be recovered as well. Decanting excess water from oily water storage is an important tool to reduce the volume of oil water that must be taken for disposal.

Oily water is pumped to a primary storage tank such as a Fastank or larger tanks. As the water separates, it can be pumped back into the containment area on the water.

- Gravity flow is the best method for decanting water from a tank.
- Ensure decanting operation is constantly monitored to ensure only water is decanted.
- Approval from the Operations Section Chief is required for any vehicle tundra travel (offroad or off-pad), which must be in accordance with Alyeska's emergency tundra travel permit. Any excavations in tundra or any tundra damage must be reported to the Operations Section Chief. All on-tundra activity must be documented and reported to the Field Environmental Generalist for reporting to ensure permit compliance. Avoid archeological sites and biologically sensitive habitats. Travel across the tundra with tracked vehicles: Heavy equipment — and even foot traffic — can seriously damage the vegetative mat, induce thermokarst, and cause structure disturbance. Using sheets of plywood as a traveling surface and minimizing trips with equipment greatly reduce disturbance of the tundra.
- Consider use of valves on discharge hoses.

FIGURE 4-23 DECANTING SEPARATED WATER IN RIVER

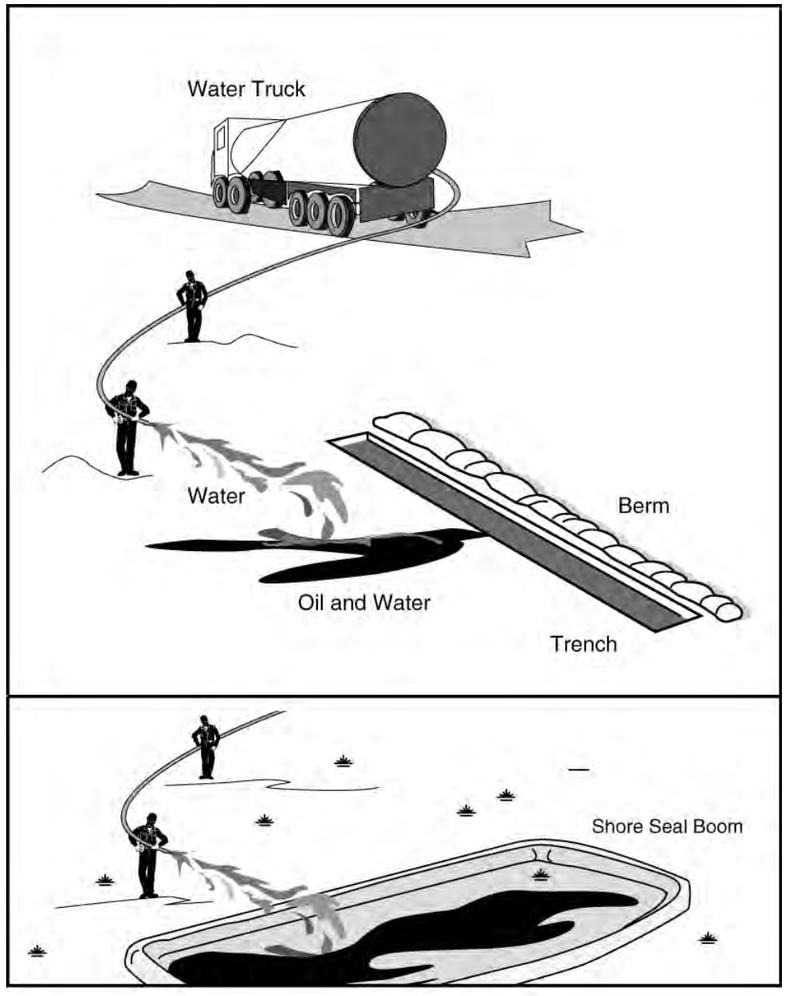


FIGURE 4-24 FLUSHING OIL ON TUNDRA SURFACE

Deployment Considerations

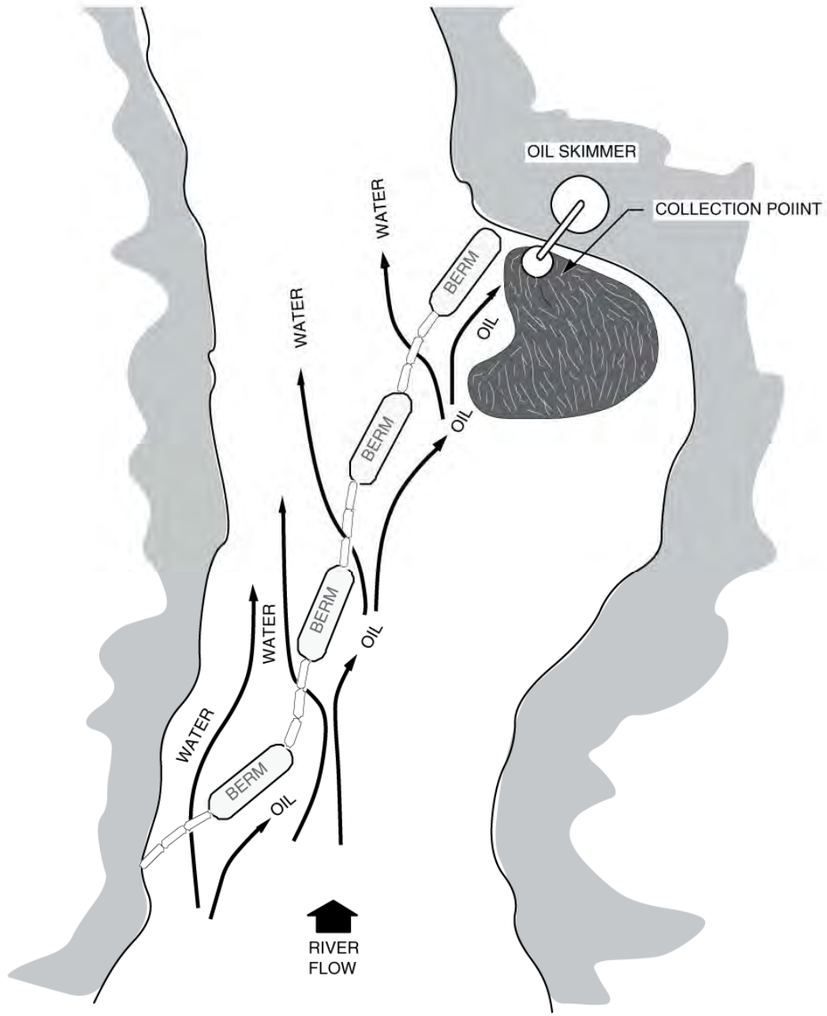
- Flushing is a viable option only when air temperatures permit. Warm water (no more than 106°F) is preferred for flushing. The appropriate flushing technique will be determined by the Field Environmental Generalist.
- Flushing works on oil contained on and in the surface of tundra, gravel, and ice, and is particularly effective on ice. The tundra can be damaged if it thaws; don't flush the same area more than 2 or 3 times and don't suck the tundra dry. Also, stay off the tundra that's being flushed.
- Personnel or small equipment should traverse the tundra on plywood sheets.
- Approval from the Operations Section Chief is required for any vehicle tundra travel (offroad or off-pad), which must be in accordance with Alyeska's emergency tundra travel permit. Any excavations in tundra or any tundra damage must be reported to the Operations Section Chief. All on-tundra activity must be documented and reported to the Field Environmental Generalist for reporting to ensure permit compliance. Avoid archeological sites and biologically sensitive habitats. Travel across the tundra with tracked vehicles: Heavy equipment — and even foot traffic — can seriously damage the vegetative mat, induce thermokarst, and cause structure disturbance. Using sheets of plywood as a traveling surface and minimizing trips with equipment greatly reduce disturbance of the tundra.

In spring or fall, flushing is used to concentrate oil into pits or trenches, where the oil is collected with direct suction using a Manta Ray skimmer head, sorbents, or a portable skimming system. The pits or trenches are constructed by cutting slots in ice, using natural depressions, digging into tundra or gravel with a backhoe or Bobcat, or by augmenting a depression or pit with sandbags and Shore Seal boom. Shore Seal boom is particularly effective when frozen in place. Constructed pits or trenches are lined with Visqueen or similar plastic sheeting.

The water source for the flushing unit is either a water truck or an auger hole in the ice of the nearby lake. Flushing usually occurs after pooled areas and contaminated snow have been removed.

The flush should consist of high-volume, low-energy flushing with water less than 106°F. This is essentially a mop-up technique after the majority of oil and oiled snow has been removed.

FIGURE 4-24 FLUSHING OIL ON TUNDRA SURFACE (CONTINUED)

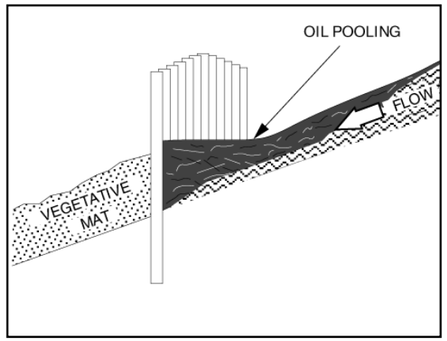


This represents a series of diversion berms joined by booms. They are positioned so that a spill can be diverted to a location with adequate storage and accessability to removal equipment. If stream and spill conditions permit, one berm may be all that is required.

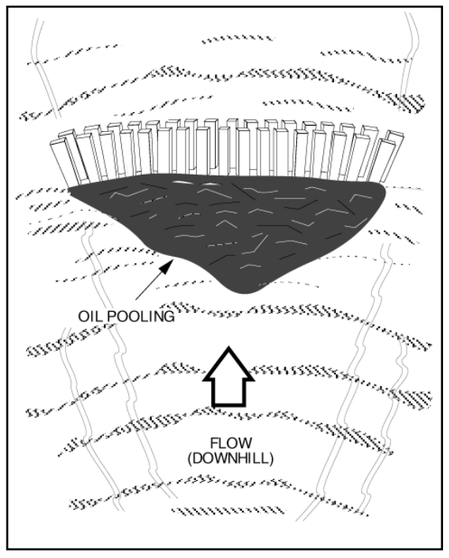
FIGURE 4-25 DIVERSION BERMS



FIGURE 4-26 BERMS BUILT ON LAND



Metal Sheets Cross-Section

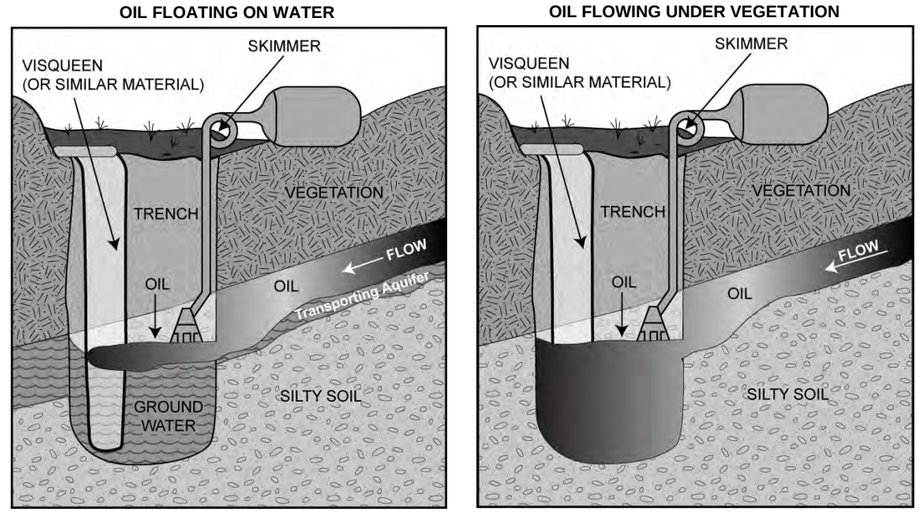


Metal Sheets Top View

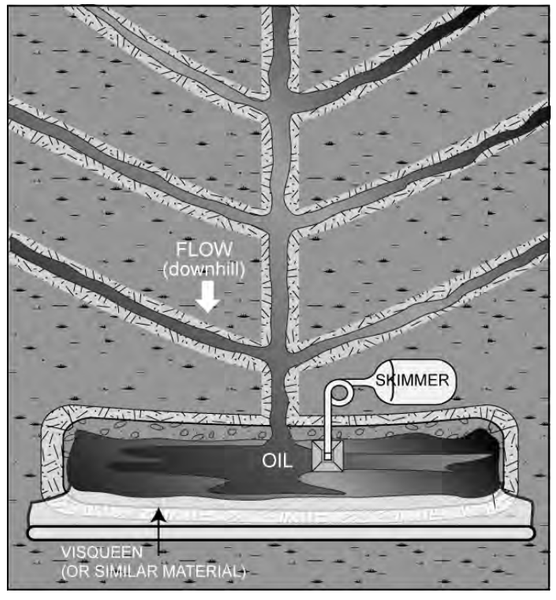
FIGURE 4-27 INTERCEPTION BARRIERS

OIL FLOATING ON WATER

OIL FLOWING UNDER VEGETATION



Trench Cross-Section



Trench Top View

FIGURE 4-27 INTERCEPTION BARRIERS (CONTINUED)

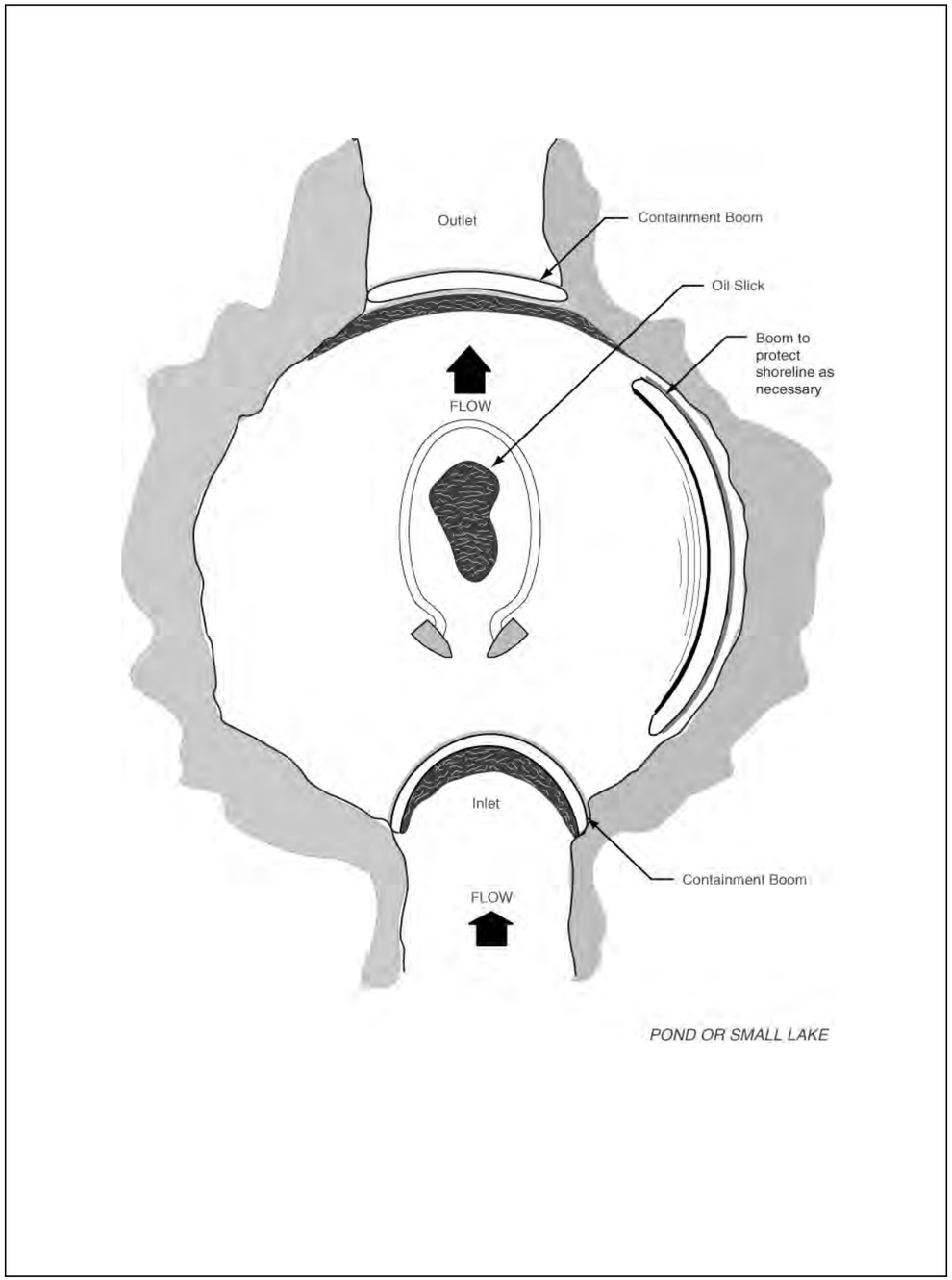


FIGURE 4-28 BLOCKING BOOMS

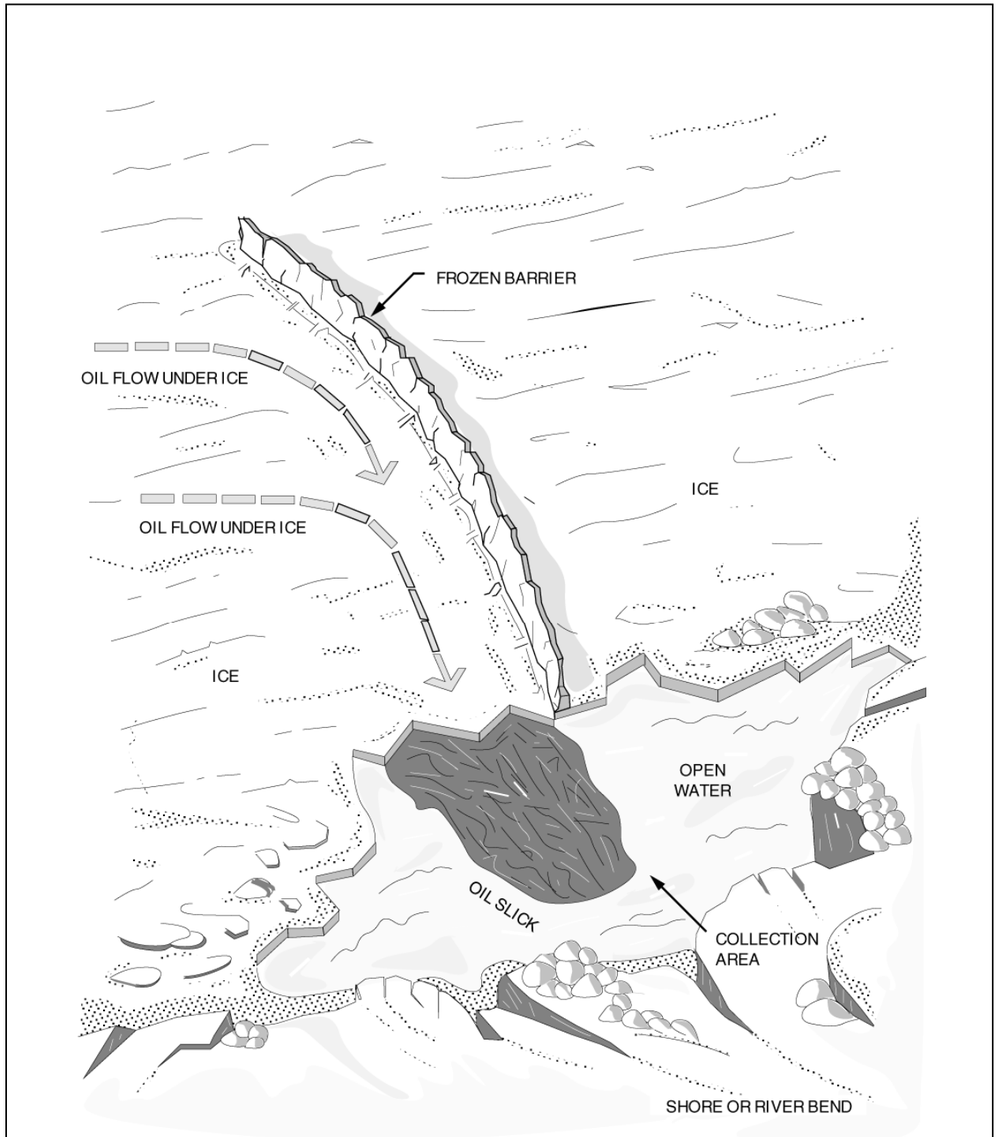
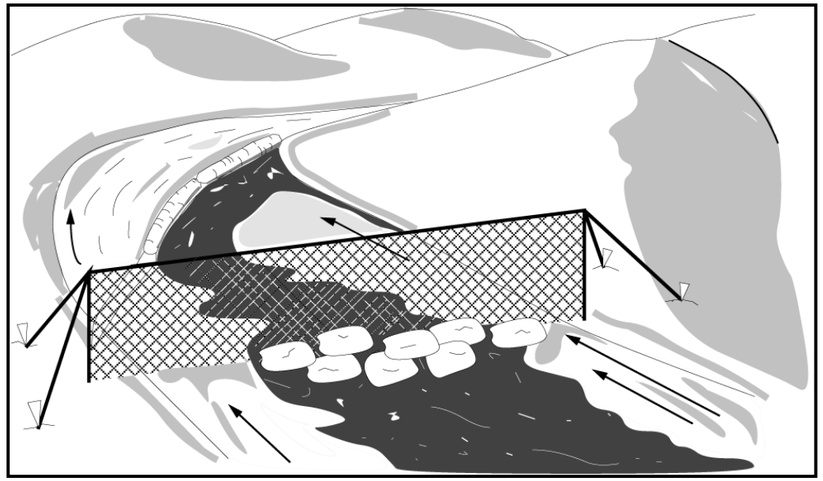


FIGURE 4-29 FROZEN BARRIER ON RIVER OR LAKE ICE



Sorbent Fence

Trash Fence

FIGURE 4-30 SORBENT FENCE AND TRASH FENCE

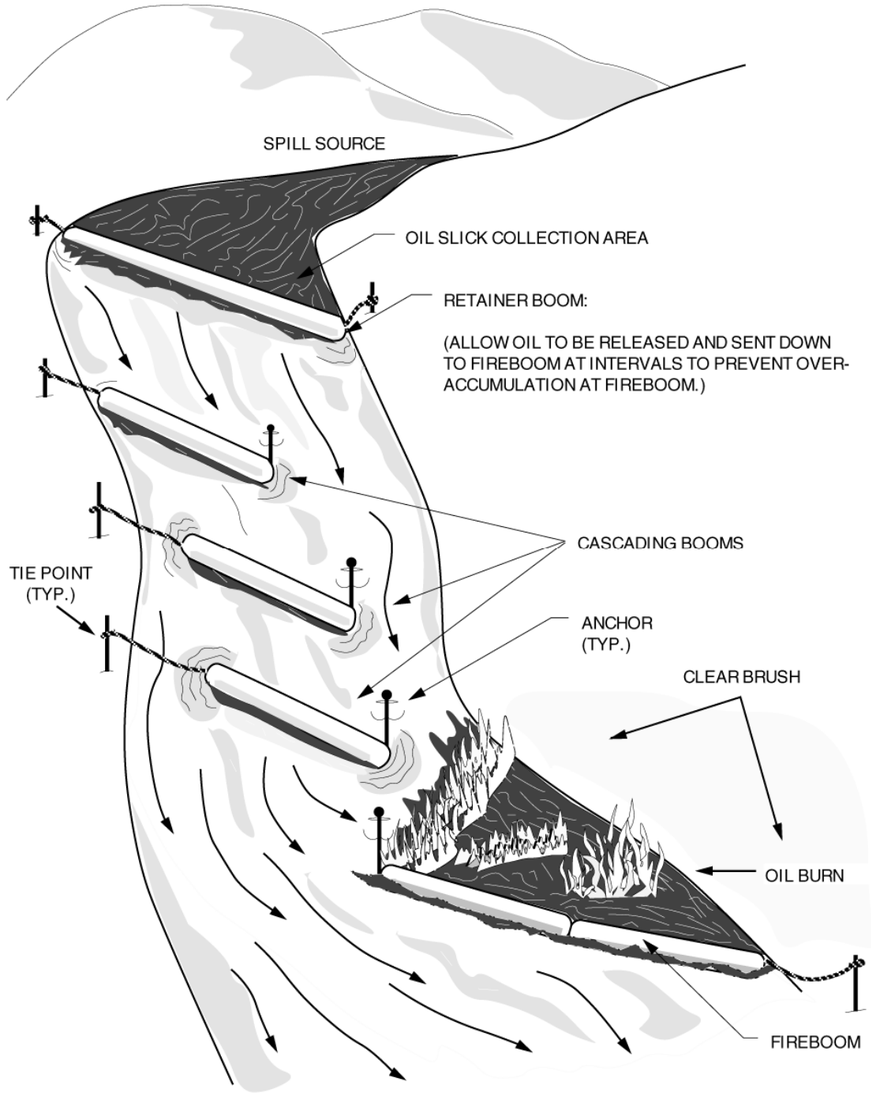


FIGURE 4-31 FIREBOOMING METHOD

4.1.2 Implementation of Containment and Exclusion Techniques

This section discusses how the techniques covered above are applied at typical locations along the path of a spill. Several techniques can be used at one location. Procedures are discussed for the following locations:

- Workpad and spur dikes
- Dalton Highway and access roads
- Tundra and forest
- Small creeks, ponds, and bogs
- Highways
- Large rivers and floodplains
- Large lakes
- Oil under ice

Implementation of containment and exclusion techniques at specific locations along the pipeline is presented in Section 3 of this volume, while Section 5 provides deployment instructions for predetermined containment sites.

With the exception of on-water containment on large rivers during breakup, the actions discussed for each location can be used regardless of the time of year.

Winter usually aids implementation of containment/exclusion actions by decreasing the flow-speed and spread of spilled oil and by extending means of access to many areas. Response time is usually not as critical as in summer. Physical containment is facilitated on thick ice or a heavy snow cover. However, snow cover can hamper containment actions by obscuring the extent of the spill, and the blocking of watercourses may be hindered due to ice and aufeis. For example, blocking a culvert containing ice should involve the complete removal of the ice to ensure an adequate seal on the culvert. In aufeis areas, a trench should be cut in some cases to stop oil from bypassing a containment area via the voids that usually occur within the aufeis.

After the contained oil has been recovered and transferred to temporary storage and there is no threat of additional oil release, the containment structures will be dismantled and cleanup/ restoration efforts will be implemented as described in Section 4.5.

4.1.2.1 Workpad and Spur Dikes

A workpad is present along the pipeline route except where the line is situated in an active floodplain, at some river crossings and where snowpads were used during construction. In addition, spur dikes have been constructed perpendicular to the workpad in a number of areas where the pipeline parallels the rivers. A spill may be confined to the workpad or near it with berms and dams. Berms should be built parallel to the workpad on both sides. Migration of the spill may be halted by constructing dams across the workpad between the berms. Spur dikes can be used to contain oil where these structures are present. Culverts in dikes will need to be blocked. The construction of a dam across the workpad is especially important where it slopes toward a river, creek, or low-water crossing. Many elevated sections of pipeline are on a portion of the workpad that is lower than the traffic lane; if spill flow is toward the traffic lane, it will serve as a berm. If flow is away from the traffic lane, a berm should be constructed on the off-side edge of the workpad.

There are several types of water crossings along the workpad, including some drainages where a structure does not exist: culverts, French drains, low-water crossings, and bridges.

Culverts can be blocked with earth (or snow) and sandbags, French drains with sheets of plywood or metal, and low-water crossings with dams or underflow dams. Earth barriers for containing a spill may have to be lined, depending on the porosity of the material and the time it takes to remove the oil.

Spills on the workpad can generally be removed with mechanical equipment.

Contaminated material along spur dikes and the traffic lane of the workpad and buried sections of pipeline can be windrowed by a motorized grader, then picked up and removed by loaders and dump trucks. Contaminated material beneath elevated pipe may have to be pulled out with a backhoe or by hand with rakes and shovels; then it can be picked up by loaders and hauled away in trucks. Contaminated snow can be handled similarly or melted for subsequent injection into the pipeline.

Contaminated material along spur dikes and the edges of the workpad would have to be pulled to where it can be picked up. This could be accomplished with backhoes or by hand with rakes and shovels. Small pools can be cleaned with sorbents, rakes, and shovels. The pipeline and its appurtenances can be hydroblasted and steam cleaned.

4.1.2.2 Dalton Highway and Access Roads

The Dalton Highway was constructed parallel to the pipeline from the Yukon River north to Prudhoe Bay. This road and the associated pipeline access roads can be used to block the flow of oil in those areas where the road occurs downslope from the pipeline. Culverts placed for drainage through these roads can be blocked with earth and Visqueen, plywood and sandbags, dams or berms for containment purposes.

If the spill area is accessible by road, a shuttle system can be set up to transfer oil to an interim storage area. If the contaminated material is primarily fluid, the preferred method of transfer is using vacuum trucks or tank trucks. Bladders or oil drums can also be used but require specialized handling equipment. If significant debris is present, lined dump trucks or dumpsters/containers will be used.

Contaminated material on the driving surface of the Dalton Highway and access roads can be windrowed by a motorized grader, then picked up and removed by loaders and dump trucks.

Contaminated material along the edges of the Dalton Highway and access roads would have to be pulled to a location where it could be picked up. This could be accomplished with backhoes or by hand with rakes and shovels. Small pools can be cleaned with sorbents, rakes, and shovels. The pipeline and its appurtenances can be hydroblasted and steam cleaned.

4.1.2.3 Tundra and Forest

Naturally occurring features such as tussocks, deadfalls, vegetation, and snow will retard or stop surface flow of oil and retain it. Additional on-site materials can be used to supplement these natural barriers. Visqueen and/or sorbent materials should be placed on the uphill side of naturally occurring barriers, except snow.

At locations where there is no permafrost, interception trenches can be excavated to divert or contain oil; they may have to be lined with an impermeable material. Trenches can be dug and barriers placed in the vegetative mat to limit subsurface oil migration — possibly in conjunction with sorbents and impermeable liners. Caution should be exercised, as excessive trampling and heavy equipment can cause more damage to the vegetative cover by working oil in than were the spill to be left alone.

The small drainage courses and rivulets of meltwater will have to be blocked using sandbags, earth, snow, sheets of plywood, or metal, sorbents, or materials found on site such as brush and logs. Courses with flowing water will have to be dammed, either conventionally or with an underflow device. Oil flowing down a dry drainage course can be partially contained by placing a sorbent boom directly in the drainage course and/or by damming. Oil that collects in small pools should be removed rapidly to decrease subsurface spill migration.

Cleanup activities in tundra and forest regimes will center on the use of light equipment and land-cleaning techniques unless the spill presents a threat to human life and must, therefore, be removed rapidly.

Presently, there are no known means for effectively cleaning vegetation. It is likely that a spill will kill low-lying shrubs, grasses, and any plants that absorb oil through its roots. Large trees with oil on their trunks should be left alone. Pools of oil can be removed with sorbents, small hand-operated pumps with skimming heads, and rakes and shovels. During the winter, contaminated snow cover can be removed with heavy equipment or manual methods, taking care not to damage the vegetative layer. In general, excessive vehicle traffic and trampling can do more damage working oil into the plant/soil/active layer than leaving a spill untreated.

It may be possible to “wash” some areas. A spill may be absorbed by the vegetative mat and flow beneath it. When this occurs, it may be feasible to flood the area with water, floating some of the oil to the surface where it can be removed with sorbents and small pumps and by hand. Small pools can be burned, if permitted, and if there is no danger of the fire spreading.

Large, bare rocks and boulders that are covered with a film of oil can be cleaned with pressurized equipment. The ground area surrounding any surface to be cleaned should be covered with sorbents before actual cleaning begins. Isolated rocks can be hand-scraped.

Removal of contaminated soil and replacement with mixed mineral-organic material has been used for some spills. Although this is a disruptive technique, this option may be required when conditions warrant and after consultation with the appropriate agencies.

4.1.2.4 Small Creeks, Ponds, and Bogs

Small creeks can be blocked entirely by damming if there is sufficient storage area upstream. However, a means of stopping the oil and letting the water continue downstream will generally be required, such as an underflow dam, an overflow berm, or a dam in conjunction with a pump or siphon. These barriers should be located so that a pond will form upstream from the barrier, allowing the use of sorbents, booms, and skimmers for cleanup. In addition, pools may exist behind log jams or debris jams where containment could be achieved. Where trees exist along the banks, they could be cut and used for booming across the stream in an emergency situation. On fast-flowing creeks, a series of containment barriers such as chicken wire (with sorbents) structures should be used. It may be necessary to remove log jams and other debris in creeks and streams to allow effective deployment and maintenance of booms. During periods of high flow, it may be necessary to install steel nets, chicken wire, or similar devices upstream of containment devices and areas in order to protect both equipment and personnel. To facilitate cleanup and removal, spills should be diverted to an area with adequate storage.

On ponds, the outlet should be boomed to let the oil collect on the surface of the pond; additional booms should be deployed around the slick to prevent it from contaminating the shoreline. Sorbent booms and conventional booms deployed in tandem can be effective, with both booms across the pond outlet. The sorbent booms should be farther downstream; they will collect portions of the spill that may have passed beneath or around the conventional boom.

Sensitive areas along creek banks and shorelines, such as waterfowl breeding sites and on important fish streams, can be protected by deploying booms to exclude oil.

Containment in bogs will most likely be limited to interception with barriers and sorbent materials. Bogs will not generally support mechanized equipment, so actions will be by hand.

Most of the preliminary cleanup in these regions will take place in conjunction with containment actions.

The soil in bogs and marshes is highly porous and will absorb large quantities of oil. In addition, it will not support equipment or prolonged foot traffic, except selectively during the winter. Cleanup operations are limited, generally, to the use of sorbents, hand-operated pumps with skimming heads, and small tools. Water flooding may be useful if large amounts of oil have reached a depression and lie beneath the vegetative cover. Permitted in-situ burning may also be a viable option in mechanically sensitive areas.

Shorelines of ponds can be cleaned by hand or with sorbents and hand-operated pumps with skimming heads. Contaminated grasses (except where there are soil erosion constraints) and debris will have to be removed by hand. Creek banks can be treated in much the same way. In addition, if the creek bed is wide enough, front-end loaders and draglines can remove large quantities of contaminated sand and gravel. Small slicks can be removed from the water surfaces with sorbents, small skimmers, booms, and hand-operated pumps with skimming beads.

With the appropriate agency permit or pre-approval, small pools of oil along the banks of creeks and ponds can be burned if no threat is posed to the surrounding vegetation.

4.1.2.5 Highways

Highways can serve as important containment barriers if the culverts passing beneath them are blocked. Most culverts are two feet or less in diameter and can be blocked with sandbags, sheets of plywood, and earth or snow. Large culverts and some small ones transporting large volumes of water will require an underflow device. Where there are large volumes of oil involved and/or inadequate storage capacity on the spill side of the highway, it may be advantageous to allow all or part of the spill to pass beneath the highway to an area downslope with sufficient storage capacity. Dams should be constructed across the borrow ditch to provide containment. The aerial photographs in Volume 4 show highway culvert locations.

Where there is no borrow ditch or where the highway is not elevated, a spill may pass over the highway if it is not blocked. A windrow (berm) of materials taken from the road shoulder may block spill flow. The Dalton Highway north of the Yukon River and portions of the highways south of the river are located on elevated roadbeds. The roadbed may act as a barrier if the culverts are blocked. Access roads between highway and workpad can serve as containment barriers if drainage structures are blocked.

Cleanup activities on and along highways are most efficient if heavy equipment is used.

Contaminated materials in the highway ditch can be removed with a grader. If the ditch is somewhat inaccessible or narrow, a backhoe can be used. Front-end loaders can place the removed material into dump trucks for hauling to a disposal area.

The choice of techniques for cleaning the road surface will depend on the nature of the surface. It is likely that most of the oil will flow off the surface of a paved road. Also, oil and water can be removed by vacuum trucks or pumped into containers. If the road surface becomes slippery because of oil contamination, sand can be spread over the oil to improve traction and later be swept up. Regardless of the methods used, care will be exercised to prevent the spill from contaminating additional portions of the right-of-way, especially the borrow ditch.

4.1.2.6 Large Rivers and Floodplains

There are two general spill situations covered here: a spill on the floodplain and a spill in the main river channel.

Oil approaching the floodplain should be blocked at the point of entry (contained within the drainage course). This is particularly important during breakup. Berms should be constructed between the spill and the main river channel. Underflow devices may be used if there is water flow. Diversion berms can be built to direct the spill to a floodplain feature (side channel, abandoned meander or channel, oxbow or oxbow lake, or excavated diversion pit). Floodplain debris can be used as containment barriers. Log jams on sand or gravel bars and side channels create pools where oil can be contained. Oil will cling to the material forming the jam. A berm should be constructed downstream from the debris to act as a backup containment barrier.

In some cases, aufeis will not present an unusual containment problem and can assist in blocking subsurface oil low along river channels. Oil-contaminated subsurface flow should be forced to the surface where sorbents, sorbent booms, and manual methods could be used to contain the oil. There is a possibility that undetected oil could become trapped between layers of aufeis, especially when aufeis is formed by an aquifer discharging into a river from the bank. Oil discoloration should be detectable, and containment with sorbents and barriers could be employed.

Oil contaminating an intragravel water flow could present a winter containment problem. Even if flowing water is not detected beneath the ice, intragravel flow may exist. The velocity would be very slow (less than ½ fps) but would provide a route for oil to flow in. If this situation exists, the stream bed would have to be trenched deep enough to intercept the intragravel flow of oil, so it can then be ponded. A location where heavy equipment could operate would be preferred.

Spills on the main river channel will be difficult to contain, and can be treated several ways. During periods of high stream flow and velocity, a series of diversion berms and booms should be used, diverting the spill to a containment pit or floodplain feature. Digging a pit across the main river channel will create eddies and pools of quieter water. This is practical only on smaller rivers where equipment can be used. This technique is more effective when used with an overflow dam directly downstream. The pit should be located where rapid removal of the oil is possible. The usefulness of booms on fast-flowing, large rivers is limited; however, they can be deployed in containment pits, upstream from natural or created pools, and near sandbars. Oil should be removed from behind the boom as rapidly as possible to prevent loss of oil and to keep the strain on the boom to a minimum. A spill entering the river can be partially controlled by deploying booms parallel to the river bank downstream from the point of entry. Under some circumstances, side channels could be converted to containment ponds if the following procedures were used:

- Berm or dike the downstream end of the side channel.
- Construct a suitable channel for diversion skimmer in conjunction with an overflow berm such that the flowing oil is diverted into the mouth of the side channel but the majority of water is allowed to flow down the main channel.

Under most circumstances, containment barriers will have to be continually maintained. Their resistance to erosive forces can be increased if the upstream portion of earth barriers is covered with large pieces of heavy material (rip-rap).

To divert a spill traveling beneath the ice, sheets of plywood or metal can be inserted into slots cut in the ice and allowed to freeze in place; similar to the diversion barriers discussed in the following subsection.

Oil spills on a river during the period of freezeup through breakup can be treated several ways. When ice is too thin to support heavy equipment and there are leads of open water, summer containment/diversion techniques with ice diversion barriers can be used. During midwinter, river ice is usually thick enough to allow use of heavy equipment, snow barriers, and ice interception barriers. Spill flow, extent of spread and the likelihood of oil entering drainage systems are all slowed or reduced during mid-winter. An exception would be a large spill on thin or broken ice. Breakup poses the greatest hazard for personnel and least chance for containment. Often, temporary ponding of water will exist behind log, debris, and ice jams. Caution is involved in the use of these locations. Typically, these jams are temporary and may release at unpredictable times. A sudden release will cause immediate increases in velocities. However, these locations could provide partial containment. Little could be done on the main channel of a major river, other than making use of natural floodplain features and other river areas where some oil might be contained and recovered safely. Oil that might be left on the floodplain as the river subsides can be contained and recovered.

Cleanup activities on floodplains and large rivers may be initiated simultaneously with containment actions.

Booms and berms are used to divert and contain spills on large rivers. The use of one or more skimming devices is part of the containment and cleanup actions associated with booms and berms. Rocks, boulders, and sand and gravel bars may be covered with a film of oil as the spill flows downstream. Rocks and boulders can be cleaned by hand-scraping or with pressurized equipment. A hand-operated skimmer with a floating head may be used in conjunction with the sorbents. Gravel bars can be cleaned simply by removing the contaminated gravel and debris. Replacement with clean materials may be necessary if the quantity removed is significant. This can be accomplished with front-end loaders, draglines, and backhoes. In order to prevent the removed instream materials from flowing downstream, sorbent booms and pads should be deployed or dispersed around the object being cleaned.

Spills that have migrated to a considerable depth in floodplain gravels can be treated several ways. The gravel can be removed, the area can be water flooded and the oil skimmed off, or the oily water can be pumped out through a drilled hole or an excavated trench. It is likely that oil penetrating to significant depths cannot be entirely removed.

In some cases, aufeis will not present a cleanup problem. Oil contaminating subsurface flow during aufeis formation should be forced to the surface. Cleanup could be accomplished using either sorbents or manual methods. There is a possibility that undetected oil could get trapped between layers of forming aufeis, especially when aufeis is formed by discharge of a riverbank aquifer. Oil discoloration in the aufeis would be detectable, and oil could be removed manually if caught soon enough. Otherwise, heavy equipment or spring thaw would be necessary to recover the oil.

In the case of a large spill, the floodplain may contain large amounts of contaminated debris that has to be removed either mechanically or by hand. Large pieces in midstream can be removed with a crane or similar piece of equipment. Care should be taken to ensure that the material being removed is not dragged across the water surface causing further contamination. Small pieces can be collected by hand. Contaminated vegetation growing on the floodplain can be clipped if there is danger of oil being transported to the water.

Oil spills occurring on a river from high water in the fall through spring breakup can be treated several ways. Until ice is thick enough to support heavy equipment or employ burning, the river should be treated as it is during the summer, using ice diversion techniques where necessary. During midwinter, ice is thick enough to employ any of the previously mentioned winter cleanup methods. Breakup poses the greatest hazard to personnel and the worst chances for a successful cleanup. Little can be done in the case of an oil spill directly into a major river during breakup, other than possible immediate burning and/or cleaning up oil that might be left on the floodplain as the river subsides.

4.1.2.7 Large Lakes

Booms are the most useful means of containment on large lakes. The most effective technique is to encircle the spill with booms. During breakup, pieces of ice may have to be removed from or moved on the surface of the lake in order to deploy booms. During the winter, ice will have to be broken up and removed to facilitate containment actions.

If oil is flowing into the lake, a boom should be secured to the shore on one side of the point of entry and deployed around the periphery of the slick by boat until the spill is encircled. As in containing oil on small lakes, sorbent booms and conventional booms deployed in tandem may be effective. Deploy both across the lake outlet with the sorbent boom downstream. Sorbent pads can be distributed between the two booms. This technique will pick up some of the oil that passes the conventional boom.

Cleanup activities on large lakes coincide with containment actions.

The primary means of containing and cleaning up spills on large lakes and bays is the use of booms, sorbents, and skimmers. Booms are used for containing and concentrating the oil. Skimmers should be used to remove the oil from the water surface, transferring it to storage for subsequent disposal. Sorbents should be used for spills of small volumes and for final cleanup of large volumes. Self-powered skimmers with onboard storage will be needed if the oil is not concentrated adjacent to the shoreline. Boats pulling boom could also capture oil for pickup by shoreline skimmers and pumps. Oil recovered using frozen barriers and booms during a winter spill could be burned if storage was not available.

Cleanup along the shoreline is done in much the same way as along a river. Contaminated vegetation can be clipped and removed. Sands and gravels can be removed and replaced. Sorbents can be used to pick up small slicks and sorbent booms deployed to clean up continuing seeps of oil.

4.1.2.8 Methods of Tracking and Containing Oil Under Ice

If a spill event results in oil that spreads to beneath the ice, Alyeska will use an ice auger to drill a series of holes in the ice to delineate the extent of the under-ice oil contamination (Figure 4-32). If oil is detected at the edge of the original delineation, additional holes will be drilled. These delineations can also be tracked using GPS coordinates.

There are also two methods of containing oil under ice: by trench and a frozen barrier. Both methods are designed to divert the oil to a location where it can be contained and cleaned up. Should an oil spill enter water beneath the ice, it is important to determine if flow is present beneath the ice cover when locating containment sites and preparing containment procedures. This can be achieved by drilling holes through the ice (usually 2 to 7 feet thick) and using a current meter to verify that water is flowing. Pockets of water can exist in the deeper holes throughout winter without a continuous flow of water.

Trench. Ice trenching involves cutting a trench in the ice at a similar angle to the current as you would when setting boom in an open river. To identify the channel, direction of flow, and spread of the current, drill test holes across the river. The width of the trench should be about 1.5 times the thickness of the ice up to about 3 feet. As the blocks of ice are cut into manageable sizes, they can be stacked out of the way and used to backfill the trench or pushed under the ice downstream to get them out of the way.

When working on ice, safety is the first consideration. Ice bearing capacity should be determined when drilling test holes. After trenching operations start, there will be water on the ice making it very slick. In addition, open water will exist as ice blocks are removed. The area should be restricted to those working on the trench. Those who are working around open water should wear a personal flotation device (PFD) and be tied off with safety lines.

Frozen Barrier. A barrier frozen in place on a lake or a river can divert oil to collection point. The barrier can be a conventional boom, plywood or steel sheeting, or wooden planks. Regardless of the barrier type, a slot is cut in the ice that is wide enough to accommodate the barrier. The barrier is placed in the slot to a depth that allows it to protrude into the water for about 6 inches, and then it is allowed to freeze in place.

Along the shoreline or bank, ice will have to be removed from a large area in order to store and remove the diverted oil. It is likely that this will have to be done, rather than the excavation of a containment pit, because of the frozen ground during the winter.

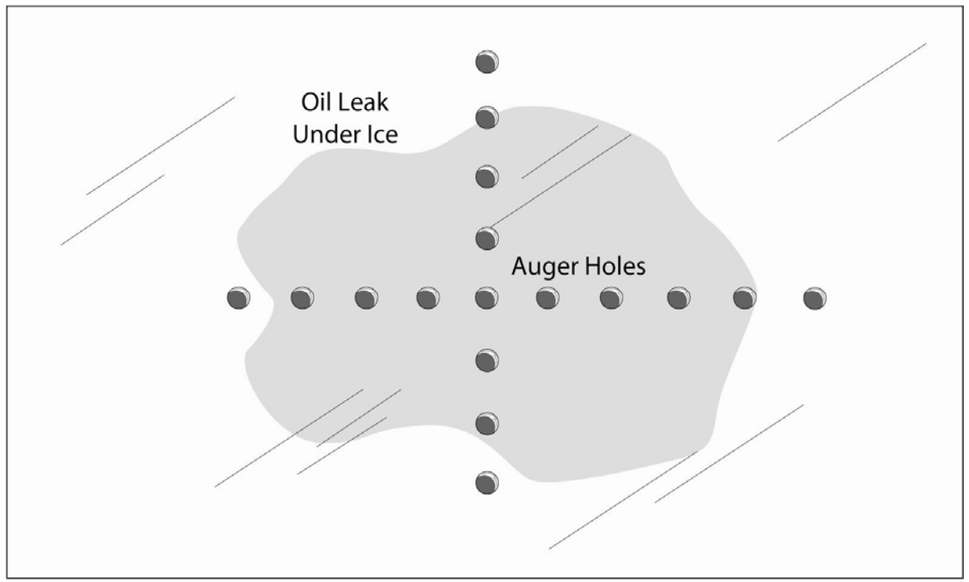


FIGURE 4-32 TRACKING OIL UNDER ICE

4.1.3 Booms

Booms are used to contain spilled oil, to facilitate its recovery, and to exclude uncontained oil from sensitive areas. To fulfill these functions, the boom must provide a barrier which controls the movement of the oil. Both rapid deployment and ease in handling are important when selecting a boom for emergency use.

Many different types of booms are commercially available or can be fabricated on site. Basically, all booms have the following:

- A means of flotation
- Barrier which extends above and below the water surface
- Means of achieving longitudinal strength

Commercially available booms can be classified into two broad categories:

- **Curtain Booms.** These include a surface float which provides freeboard and supports the subsurface curtain. The flexible curtain (skirt) is the subsurface barrier and may be stabilized by weights or a cable.
- **Fence Booms**. These have a rigid or semi-rigid material as a vertical screen against oil floating on the water.

Many types of booms are manufactured commercially for a variety of conditions; ocean, harbors, rivers, lakes, and shorelines. Booms are available for use in Prudhoe Bay, Port Valdez, Prince William Sound, large lakes, and rivers. Booms are also available for use in small lakes and streams. They are stored at specified locations along the pipeline. In some situations where commercial boom is not available, emergency booms can be built using timbers or plywood.

4.1.3.1 Boom Deployment

Speed in deploying boom is essential in order to contain the maximum amount of spilled oil. Boom should be deployed, taking into account the prevailing wind and currents. Boom should be deployed to block the flow of oil and/or to divert the oil to a collection point for cleanup. The stationary end of the boom (i.e., oil collection area) should be on the bank of the water body toward which the wind is blowing, and down current of the water flow direction.

When the boom is at right angles to the current, surface flow of water and oil is stopped. At current speeds approaching one knot, vortexes (whirlpools) and entrainment may suck the oil down and under the boom. Holding the boom at an angle of less than 90 degrees to the current permits surface oil and water to flow downstream along the boom into the collection area and/or against the shore. The reduction in the angle of the boom causes a decrease in the current speed striking the boom. Recommended boom deployment angles for various current speeds are shown in Figure 4-34.

Booms are deployed in either a fixed or a mobile mode. In deployment, the boom does not move in relation to the water as, for example, a boom deployed between two fixed-anchor points. Mobile deployment involves moving the boom and is commonly used in conjunction with a skimmer during cleanup.

4.1.3.2 Behavior of Deployed Boom

The velocity of the current is the prime consideration in successful deployment of boom. Research reveals that booms are generally not effective for containment of oil in current velocities above 1 knot. However, booms may be used in fast currents to divert the oil slick to a region of low-water velocity. Booms that fail due to current velocity do so by permitting the oil to pass under the skirt. This failure is a function primarily of current velocity and oil density, and depends only slightly on boom skirt depth. Figure 4-33 shows the minimum boom depth required in relation to the current for various specific gravities of the oil. As indicated, a 10-inch skirt is required to contain 0.90-specific-gravity oil in a 1-knot current, and a 30-inch skirt is necessary in a 2-knot current. The force on a boom with a 30-inch skirt in a 2-knot current is six times that of the 10-inch skirt in a 1-knot current. This larger, stronger boom is less manageable and cannot respond or be deployed quickly.

Extensive testing under actual conditions indicates that the best performance of a boom in both stability and oil retention occurs when it takes a parabolic shape. The optimum range of boom length is 1.25 to 1.57 times the straight-line distance between mooring points. Booms are most effective at 1.5 times the span, which is the arc length of a semicircle. Booms seem to become unstable when their length is less than l.25 times the span. It should be remembered that a sharper curve at the center of the boom will cause a quicker buildup of oil so that skimming equipment will be required sooner.

4.1.3.3 Fixed Boom Deployment

In fixed boom deployment, both ends of the deployed boom are fixed from shore to shore, bank to bank, or anchor point to anchor point, thereby creating stationary barrier to oil flow. When the current exceeds one knot, fixed diversion booming is often necessary. The boom should be deployed at an angle to the oil movement so that the oil is diverted into calm water, where pickup is more effective. Oil will flow with the water current and parallel to the boom toward the oil collection area.

Another type of fixed-boom deployment which is useful on rivers and lakes requires that one end of the boom is fixed to the shore or an anchor point and the other is attached to a boat or a tracked piece of heavy equipment. The mobile end of the boom can be moved up or down current until it reaches a position where oil is diverted along the boom rather than over or beneath it. The angle of deployment can be adjusted to meet the existing wind and current conditions.

4.1.3.4 Mobile Boom Deployment

A boom can be towed behind one or two vessels as a method of collecting and concentrating an oil slick. Figure 4-35 shows a typical mobile boom deployment. As the boom is towed through an oil slick, a smooth-surfaced pool of calm water is formed in the “V” of the boom. Contained oil tends to concentrate and stay in this area. This pool, which can be maintained during towing at speeds up to about 1.5 knots, is sufficiently large and stable to provide a suitable area for the operation of a skimmer. The speed of the boom relative to the water must be low enough to prevent leakage of oil under the boom. If the force with which the current is striking the boom is excessive, it can be lowered by reducing the angle at which the boom intercepts the current, as explained in the earlier discussion of boom deployment angles.

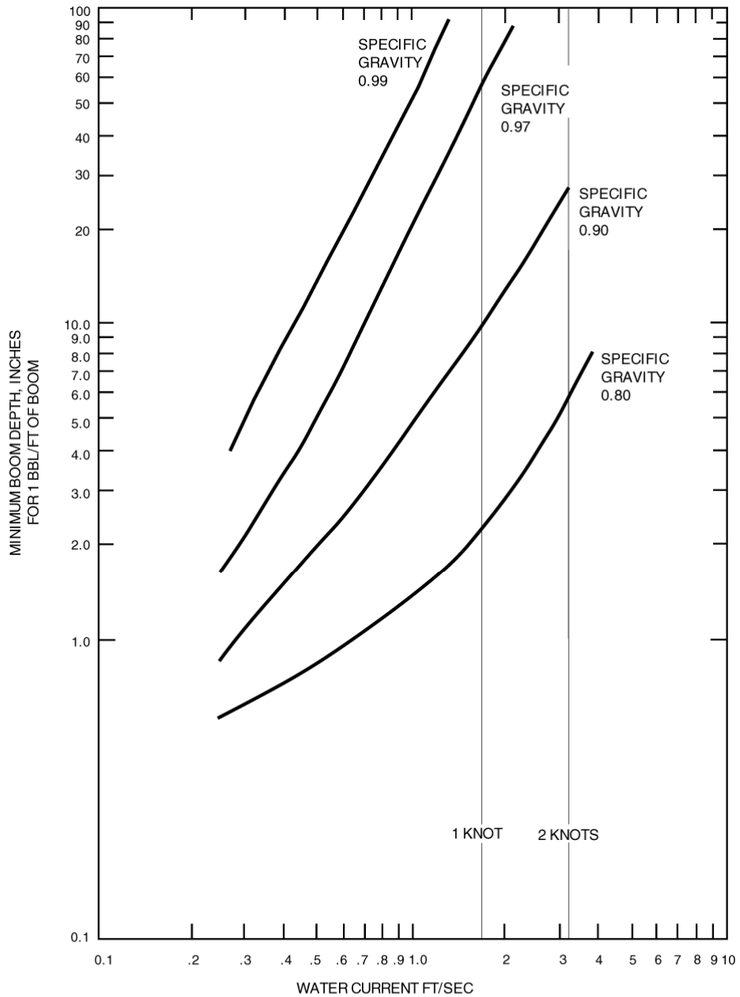
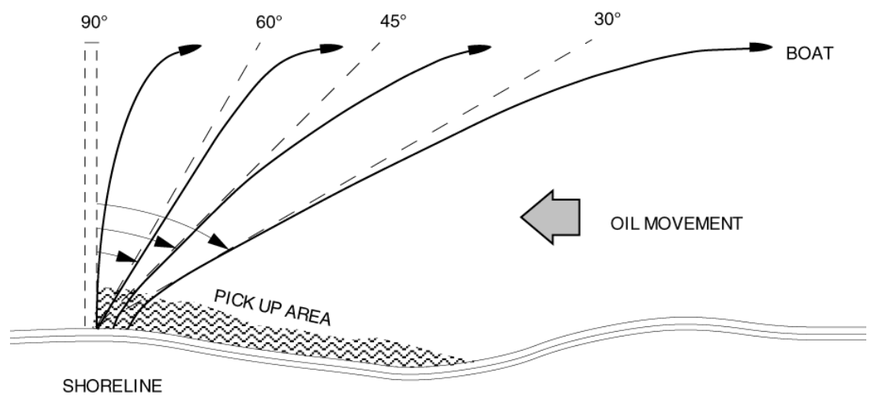


FIGURE 4-33 MINIMUM BOOM DEPTH VERSUS CURRENT



The data is based on 1 knot as being the maximum velocity striking boom before losing effectiveness.

CURRENT (KT)	CURRENT (FPS)	BOOM (ANGLE)
1.1	1.9	60
1.2	2.0	55
1.3	2.2	50
1.4	2.4	45
1.6	2.7	40
1.7	2.9	35
2.0	3.4	30

Difficulty in deployment will increase and effectiveness will decrease as a function of water velocity.

FIGURE 4-34 BOOM DEPLOYMENT ANGLES

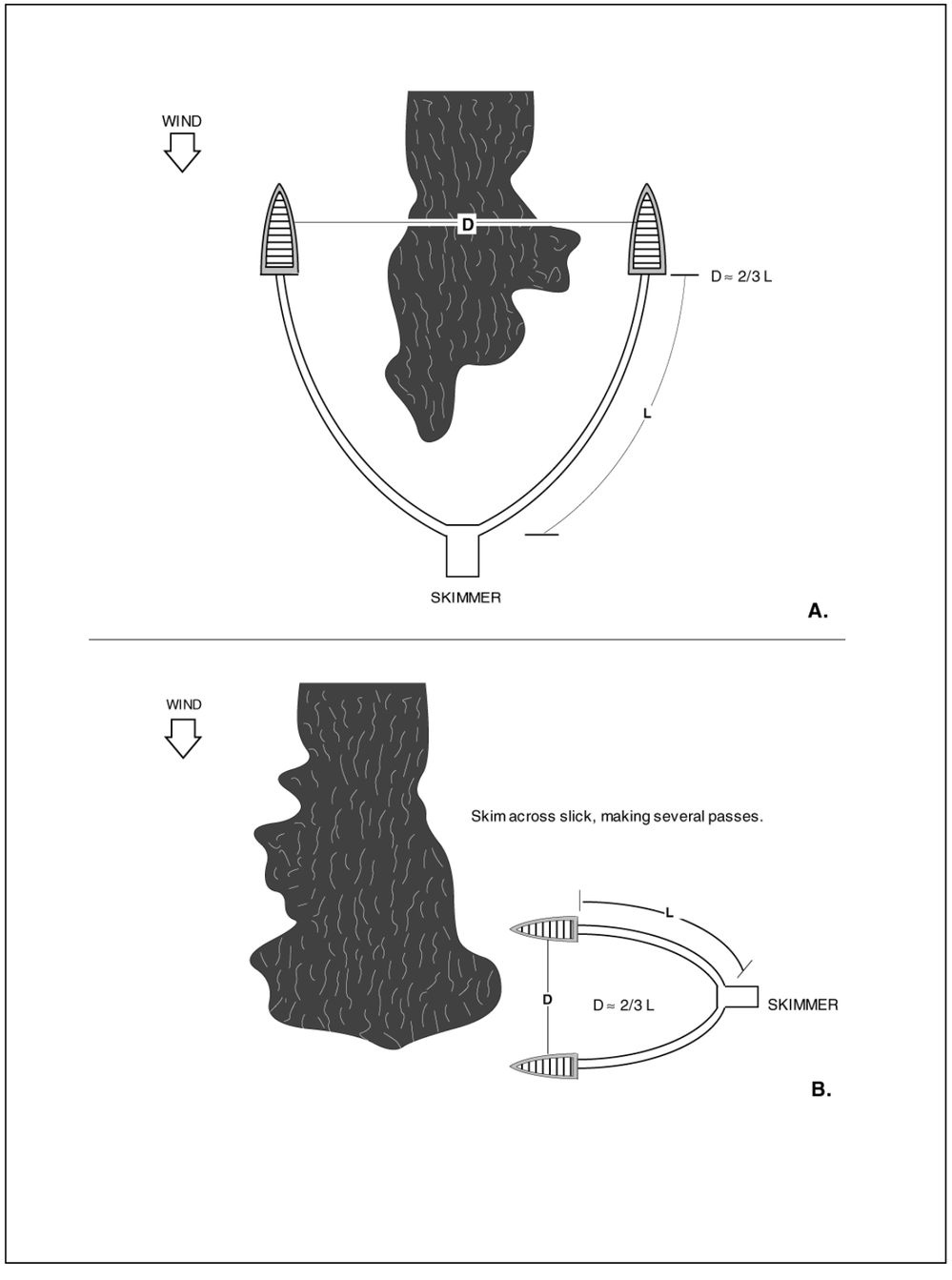


FIGURE 4-35 MOBILE BOOM DEPLOYMENT

4.2 PUMP STATION CONTAINMENT AND CONTROL STRATEGIES

The major aboveground tank farms at the pump stations are those which house the crude oil and turbine fuel tanks. These tank farms are present at all pump station sites, except PS11. In addition, small tanks located around the pump stations have lined dikes under them or are double-wall tanks.

Large tank farm dike areas are constructed of built-up berms and lined with a flexible synthetic liner (except PS01 and PS08) system which has been tested to meet State of Alaska impermeability criteria (Project M6856, “Evaluate Secondary Containment Areas”). PS01 and PS08 depend on natural soil conditions in the containment area to provide a barrier and impermeability. At PS01, part of the secondary containment basin consists of a natural lakebed with a layer of silt on the surface to a depth of up to 8 feet. The shallow permafrost further inhibits infiltration of oil into the silt. At PS08, the basin bottom consists of natural-height weathered schisty bedrock, silt, and silty sand. Dike walls also have a high silt content. pump station secondary containments and capacities are detailed in Volume 1 of this C-Plan.

Any oil spilled into secondary containment would be held in the containment until recovered via pumps.

A listing of equipment available for recovery operations is in Volume 1.

Other small containments on the station, either inside buildings or on the ground, will hold the spilled oil until it can be recovered by pumps or drained to a sump for reinjection into the pipeline.

Oil spilled outside of containment on station grounds will migrate as shown in the pump station surface drainage diagrams in Volume 1.

Techniques and countermeasures previously described for use in a pipeline spill to open ground will be used to provide containment and control until recovery could be accomplished.

4.3 RECOVERY STRATEGIES

This section discusses equipment, methods, and strategies which would be used to recover spilled crude oil or diesel fuel along the pipeline right-of-way and at pump stations.

The 800 miles of 48-inch pipeline comprising the Trans Alaska Pipeline System (TAPS) traverse many variable types of terrain and is subject to a wide range of weather conditions. The following discussion covers typical situations along the pipeline. Recovery and cleaning efforts focus on getting oil and oil-contaminated material into containers and transferring it to interim storage sites or pump stations. Once at an interim storage site, disposal options will be determined. Oil or oil/water/snow mixtures can be separated from solids and the oily mixture will be reinjected into the pipeline. Oiled debris or other material can be disposed of as shown in the flow diagram provided in Figure 4-36. Response strategies employing specific examples of representative tactics for oil recovery can be found in Volume 2 of this C-Plan.

4.3.1 Recovery

If an oil spill occurs, Alyeska will give particular emphasis to preventing oil from reaching water by containing it at the source. Contained oil will probably fall into one or both of the following categories:

- **Water**
  - Contained by boom/culvert/dike/dam
  - Diverted or contained in a temporary holding area
- **Land**
  - Pooled oil or oil/water/snow mixture
  - Oil/soil/vegetation mixture
  - Oil/debris/gravel/sorbent mixture

Recovery of oil from water is usually accomplished by using skimmers to selectively collect oil, while minimizing the collection of water. Oil on water can also be diverted to a pit or otherwise concentrated to a thickness where pumps can be used directly. Pumps are generally effective in recovering pooled oil or oil/water/snow mixtures on land.

Effective oil/water separators can be constructed under field conditions to separate oil from oil/water mixtures before transport. Any container with an outlet (valve) at the bottom can be used for this purpose. The oil/water mixture enters the container at the top, is allowed to settle, and water can then be drained off the bottom through the drain pipe. The oil then can be pumped from the containers to a storage tank or tank truck. Prior approval is required from state and federal agencies for any discharges of oil/water mixtures to land or water.

Debris in the form of sticks, leaves, and grasses may be present and mixed with oil on the surface of the water. Oil recovery device operators will be directed to remove accumulations of oiled debris by hand from in front of the recovery device. This oily debris will be set aside in a lined area adjacent to the skimmer, or be placed directly in plastic bags for later collection and disposal.

4.3.2 Response Equipment

This section describes the response equipment available to control, contain, and recover spilled oil. Alyeska, through ownership or contract, has access to a wide range of oil spill response equipment needed to meet the full range of oil types, viscosity and environmental conditions expected.

4.3.2.1 Skimmers

Skimmers are mechanical devices used to selectively recover spilled oil from land and water. There are two main types of skimmers: weir skimmers and oleophilic skimmers.

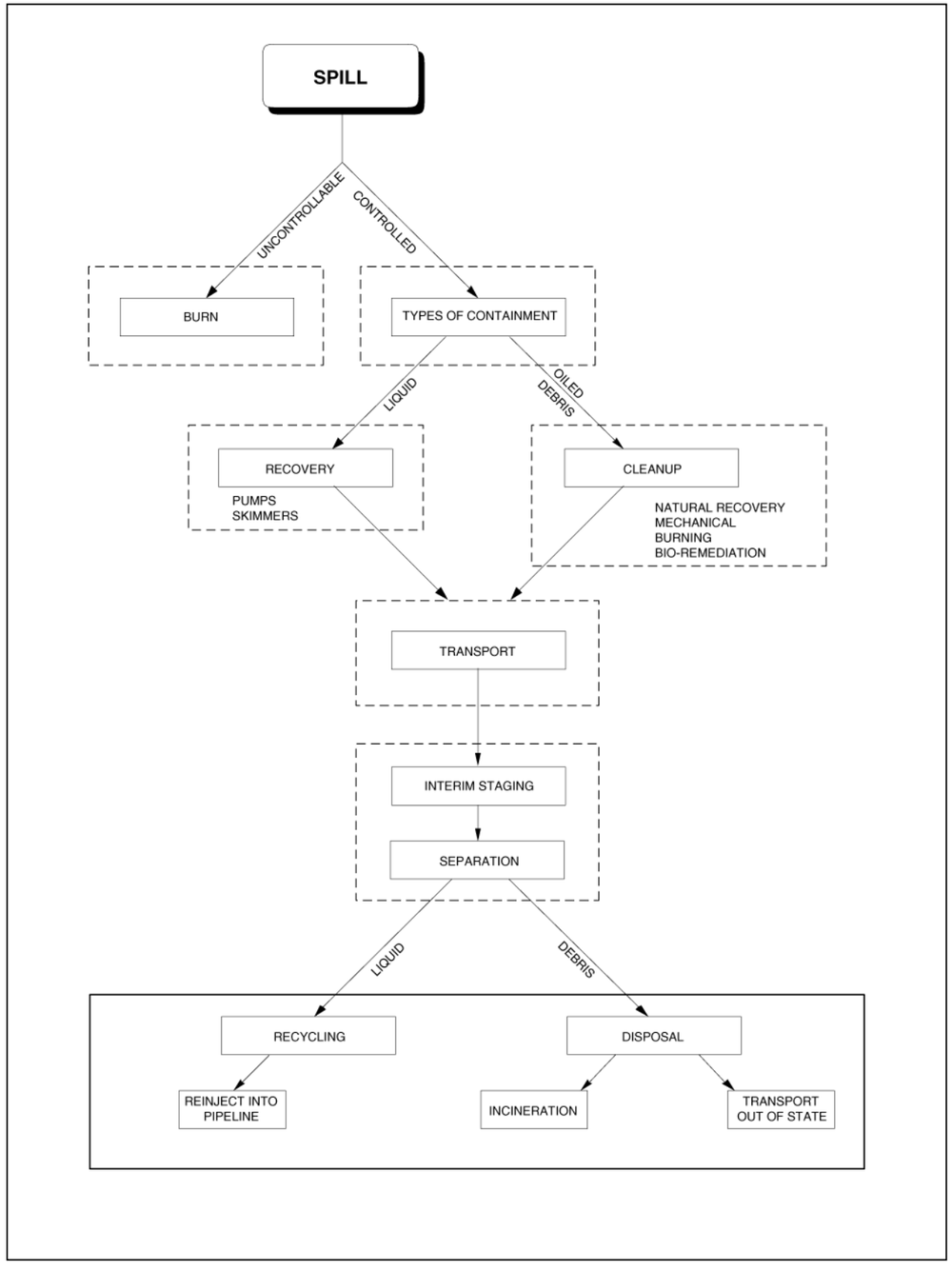


FIGURE 4-36 RECOVERY, CLEANUP, AND DISPOSAL

4.3.2.2 Weir Skimmers

Weir skimmers operate on the principle of the specific gravity differential of water and oil. The lip of the weir is positioned at the oil/water interface. The oil flows into the collection bowl of the skimmer and is pumped away to a recovered oil temporary storage tank.

Weir skimmers operate most efficiently in thick layers of oil. Thin layers of oil on water allow a greater quantity of water to be recovered with the oil. Careful adjustment of the weir lip, cycling of pumping, and use of containment systems to increase the thickness of the oil layer can improve weir skimmer efficiency.

Increase in oil viscosity due to cooling or emulsification can also reduce the efficiency of weir skimmers. Oleophilic skimmers will generally work more efficiently with viscous oil.

4.3.2.3 Oleophilic Skimmers

Oleophilic skimmers operate on the basis that oil will adhere to certain materials and water will not adhere. Oleophilic skimmers are constructed with rotating discs, drums, belts, or brushes. The spilled oil adheres to these surfaces and is squeezed or scraped off into a collection sump to be pumped into a temporary storage container. These will work efficiently over wide range of oil viscosity. This type of skimmer also tends to be more resistant to debris due to the selective nature of the oleophilic material.

4.3.2.4 Skimmers Selected for Alyeska Pipeline Service Company

A wide range of water, terrain, and weather conditions exist along the 800-mile pipeline corridor. Alyeska has purchased a number of different types and sizes of skimmers for use in recovering spilled oil.

A range of oil types and conditions of spilled oil can also occur. The types of skimmers in inventory also work with the range of oil types and viscosities that could be encountered along the pipeline and at pump stations. Oil types have been defined and described in the *World Catalog of Oil Spill Response Products* and are shown below. This oil typing has been adopted by the oil spill response industry and is cited by equipment manufacturers and equipment testing organizations.

TYPE	VISCOSITY-CST	EXAMPLES
I	150-250	Light crude oil and refined fuel oils such as gasoline or diesel fuel
II	1,500-2,500	Prudhoe Bay crude, 25% weathered (10 to 15c)
III	17,000-23,000	Bunker C oil
IV	50,000-70,000	Heavy weathered crude oil, heavy Bunker C oil
V	130,000-170,000	Heavily emulsified crude oil

Another criterion for skimmer selection is the physical size of the unit and its individual component parts. The size of the unit can affect the mobilization requirements, water depth at point of use, and numbers of personnel required to set up and maintain the skimmer in efficient operation. The majority of the skimmer systems designated as first response units along the pipeline have been selected on the basis of high efficiency and portability.

4.3.3 Pumps

Vacuum trucks and pumps (diaphragm and other types) are capable of pumping large volumes of oil rapidly and are essential in cleaning up a spill. Hoses and/or temporary pipelines may be used in conjunction with the pumps to move the oil to the desired location.

Vacuum trucks can be positioned where they can directly remove oil from behind a boom. They can pump the oil into a containment pit, another truck, or into their own storage tanks.

If the spill area is accessible by road, a shuttle system can be set up to transfer oil to an interim storage area. If the contaminated material is primarily fluid, the preferred method is using vacuum trucks or tank trucks. Bladders or oil drums can also be used but require specialized handling equipment. If significant debris is present, lined dump trucks or dumpsters/ containers will be used.

If the spill area is accessible by water, a shuttle system may be set up using boats/bladders/ barges to transfer to an interim storage area.

Bladders, oil drums, dumpsters, or other trailerable containers can be used to shuttle oil and/ or oiled debris to an interim storage area if access can be obtained by all terrain vehicles (ATVs).

Specific advantages and disadvantages of the pump types positioned at various locations on the pipeline are provided below.

4.3.3.1 Diaphragm Pumps

Diaphragm pumps can be useful in cleaning up large terrestrial spills. Because of their pumping characteristics, they are capable of moving oil/water/sediment mixtures without emulsifying the product. They are most efficient when the intake head is entirely submerged in the spill. The discharge hose can lead into a truck, containment pit, or bladder. Diaphragm pumps are especially suited to pumping liquids containing sticks and other debris.

ADVANTAGES	DISADVANTAGES
• Can run dry indefinitely • Can tolerate high concentrations of fine solids • Self-priming • Gentle pumping action • Small and easily portable • Easy to repair in the field • Inexpensive for their high volume output • Air-operated versions are inherently safe around flammable oil	• Diaphragms occasionally burst when pumping fluids • Some diaphragm materials are not resistant to oil or emulsions • Some types need remote air compressors • Pumps with worn ball valves tend to lose self-priming capability • Usually cannot operate against high back-pressure • Pulsating flow is undesirable for many weir skimmers • Pumps have a tendency to “wa k” unless properly secured

4.3.3.2 Centrifugal Pumps

Centrifugal pumps are capable of relatively high pumping capacities. They are acceptable for pumping water or relatively pure oil but will emulsify oil/water mixtures.

ADVANTAGES	DISADVANTAGES
• Small, lightweight, easy to handle • High output capacity with low viscosity fluids • Inexpensive considering its rated output • Mechanically simple (one moving part) • Tolerant of most debris and suspended solids • Easy to repair in the field	• Output decreases markedly with increasing viscosity of fluid and/or increasing back-pressure • Many models are not self-priming • Subjects fluids to very high shear which can emulsify oil and water mixtures • Stringy debris impairs pump performance

4.3.3.3 Screw Pumps

Screw pumps are a type of progressive-cavity positive-displacement pump designed to pump viscous liquids at discharge pressures higher than centrifugal or diaphragm pumps.

ADVANTAGES	DISADVANTAGES
• Can pump very viscous liquids • High discharge pressure • Can handle small to large debris • Limited run-dry capability	• Not self-contained; requires hydraulic power pack. • Suction pressure limited

4.3.3.4 Vacuum Pumps/Systems

Vacuum pumps/systems are comprised of a vacuum chamber and vacuum generating pump. These systems are generally configured as truck, trailer, or skid mounted systems. Vacuum systems are generally simple to mobilize (trucks/trailers) and are used frequently for small spills that are accessible by road.

ADVANTAGES	DISADVANTAGES
• Very debris-resistant • Works well on wide range of oil viscosity • Easy to mobilize	• Suction height limited to 15-20 feet. • Suction length limited • Truck-mounted systems restricted to road access.

4.3.4 Sorbents

A sorbent is any material which absorbs oil or to which oil adheres. A sorbent should be oleophilic and hydrophobic. Oil sorbents may be divided into three general classes by origin:

- Naturally occurring materials
- Modified or chemically treated natural materials
- Synthetic or man-made products

The natural materials may be further subdivided into vegetable, mineral, and animal classes. Sorbents are also classified according to their composition or physical form (e.g., powdery, granular, and fibrous materials; preformed plastic slabs or sheets; and synthetic foams generated at the time and place of use).

Types of sorbent materials currently available are as follows:

- **Natural Origin.** Sorbents derived from vegetable sources are straw, hay, seaweed, kelp, ground corncobs, natural grasses, wood bar, ground bark, sawdust, reclaimed fibers from paper processing, and peat moss. Sorbents derived from mineral sources include the various clays – montmortillinite, kaolin, fuller's earth, diatomaceous earth, etc.; vermiculite and the other micas; many forms of silicates: perlite, pumice, and asbestos. Sorbents of animal origin include chrome shavings from leather processing, wool wastes, feathers, and textile wastes.
- **Modified Natural Materials.** Most of the above-mentioned sorbents can be treated to produce a more desirable result. Typical examples are expanded perlite, charcoal, stearate-coated talc, asbestos treated with surfactant, sawdust, and vermiculite coated with silicones.
- **Synthetic Products.** These sorbents include a vast array of substances broadly categorized as plastics and rubber, but more specifically as the polyurethanes, polypropylenes, ethylenes, styrenes, resins, polymers, and copolymers.

Sorbent materials are presently available in four distinct forms:

- Squares and strips (pads)
- Rolls
- Sorbent booms, mats, and pillows
- Loose material

In general, with the present best available technology in sorbent systems (dispersal, recovery, and disposal), sorbents are not recommended for use except to remove thin films or iridescence during the final cleanup phases and to prevent the spreading of oil spilled on land. Sorbents can also be used to prevent contamination of facilities (walkways, work area, etc.) on which oil spill cleanup equipment and/or personnel are mobilized during the cleanup operations.

A discussion of the use and limitations of each sorbent form follows.

4.3.4.1 Squares and Strips (Pads)

Squares and strips of sorbent material can be used in small, contained areas to pick up small quantities of oil that are difficult to remove with mechanical equipment (skimmers, vacuum equipment, etc.). In such areas, they can be left for a period of time to increase their effectiveness.

Squares and strips, however, present a recovery problem. If they are placed in an area where tidal action, currents, or winds can act upon them, they will float or be blown away and be difficult to retrieve. A tether line attached to the sorbent material will assist in their recovery.

To increase the oil pickup efficiency of sorbent pads, continual moving and turning of the pads is necessary. Caution must be exercised when removing the pads from the oil-contaminated area to minimize the dripping of oil onto clean surfaces. A 55-gallon drum or other suitable container must be readily available to receive the oily pads.

4.3.4.2 Rolls

Rolls of sorbent materials can be used in the same manner as squares and strips and are usually made of similar materials. They generally are easier to use than squares or strips since they can be used in either short or long lengths. Like squares and strips, their oil absorption is limited unless they are continually turned or moved. Disposal of oiled rolls is easier since they can be rolled up and placed into a suitable container.

Rolls of sorbent materials are very effective in protecting walkways, boat decks, working areas, etc., from oil contamination. Areas onto which oil or oil-covered debris are to be placed should be covered with rolls of sorbent material. They can also be used as a protective barrier to keep oil from uncontaminated areas.

4.3.4.3 Sorbent Booms

Sorbent booms are designed to serve a dual function, that of absorbing oil and acting as a boom. However, with the present design of these booms, several operational problems exist:

- With present covering materials (burlap or mesh), penetration is limited unless booms are rotated or worked around in the oil.
- Mesh-covered booms are generally fragile, and any rough usage breaks the mesh envelope, resulting in additional cleanup problems.
- End connections on sorbent booms are not suitable for efficient installation of a continuous boom.

Sorbent booms can, however, be used to protect sheltered areas from becoming contaminated with oil. They are also effective when deployed behind skimmers to pick up oil which escapes the skimmer.

Sorbent Pillows

Sorbent pillows are generally open-mesh bags of sorbent material that can be easily placed on spill areas to absorb oil. Recommended for use in oil pickup from small, confined areas.

Sorbent Mats

Sorbent mats are made from sorbent squares or rolls, reinforced with canvas and nylon netting, and include metal grommets for easy handling. The sorbent mats can be used as flat booms on streams and in cleaning up pooled oil. Because of the nylon net reinforcement, the mats are stronger than sorbent rolls and, therefore, can be tied across streams to soak oil from the water surface. The flat surface of the mat offers a much greater surface area for absorbing oil than does the cylindrical sorbent boom.

4.3.4.4 Loose Materials

Loose-type sorbent materials should not be used on oil spills on large bodies of water because:

- Recovery of sorbents in the form of loose materials (straw, polyurethane foam, peat moss, etc.) on a large scale in open water has never been attempted; and at present, no commercial equipment is available for the harvesting of loose sorbents.
- Without efficient means of recovering loose oil-soaked sorbents, they may be dispersed over a large area by tidal action, wind, and currents, thus increasing the cleanup effort.

Some loose sorbent materials tend to clog skimmers and pumping equipment.

Loose sorbent materials may have limited use in the cleanup of oil from land areas where pools of oil have formed in depressions, etc. Snow is also considered a loose sorbent material and can be used to pick up pools of oil.

4.3.5 Accessibility

Recovery and cleanup of spilled oil are governed by weather conditions, accessibility, condition of oil, and other factors. Oil contained in any of the land or water modes listed in Section 4.3.1 must be transferred to a container that is governed by the type of access. Surface sensitivities to access must also be considered (see Section 1.6 in Volume 1). The following types of access are typical:

- Road access
- River access
- ATV access
- Remote/no surface access

4.3.5.1 Road Access

Wherever possible, existing road access should be used. This includes the pipeline right-of-way, access roads to the pipeline and material sites, as well as the public road system. In winter, ice roads can generally be constructed as required to provide access.

4.3.5.2 River Access

If the spill area is accessible by water, a shuttle system may be set up using boats/bladders/barges to transfer to an interim storage area. If the spill has reached water, particular attention must be directed toward making sure that the oil is recovered before it escapes the diversion or containment system being employed. If the amount of oil or river/stream conditions are such that the oil may escape containment, burning the oil as a option to eliminate the spilled oil may prevent further environmental damage (see Section 1.6 in Volume 1).

4.3.5.3 All-Terrain Vehicle (ATV) Access

Bladders, oil drums, dumpsters, or other trailerable containers can be used to shuttle oil and/or oiled debris to an interim storage area if access can be obtained by all-terrain vehicles (ATVs). Great care should be exercised to ensure that recovery efforts do not increase environmental damage, as discussed in Section 1.6 in Volume 1.

4.3.5.4 Remote Impact Areas Having No Access

If an oil spill gets into a rough or remote area having no direct access, transport options become very limited, particularly if in avalanche or slide areas. A road could be constructed to the site, but a careful determination will have to be made evaluating potential environmental damage due to road construction compared to alternative actions with possibly less environmental impact. These could include, but are not limited to:

- Burning in-situ
- Temporary storage and removal in winter
- In-situ remediation
- Temporary pipeline
- Helicopter slinging in containers

4.3.6 Cleanup Techniques

Five basic techniques which, when used singly or in combination, can facilitate the removal of spilled oil and oil-contaminated materials. These include the use of:

- Heavy equipment
- Pressurized equipment
- Manual methods
- Sorbents
- Pumping and flotation

4.3.6.1 Heavy Equipment

Special care must be used by the operators of any heavy equipment to prevent surface disturbance of sensitive soils and/or vegetative cover.

Graders and scrapers can be used to remove oil-contaminated sands from river deltas and floodplains. Graders cut and place the contaminated layer into windrows. Scrapers straddle the windrowed material and haul it to the nearest temporary storage area. If oil contamination of the sand is spotty rather than continuous, front-end loaders and dump trucks would be the most efficient cleanup combination.

Bulldozers and front-end loaders can be used to remove oil-contaminated gravel from floodplains. Floodplain gravel, because of its high permeability, can be contaminated to greater depths than sand. Bulldozers can excavate the contaminated gravel, which can be picked up by front-end loaders and placed into dump trucks. The same basic technique can be applied in cleaning up a spill along a highway or pad. Bulldozers and motorized graders windrow contaminated material for loading into dump trucks.

Areas that are inaccessible to large pieces of equipment, but are adjacent to a floodplain, a road, or the workpad, can sometimes be reached with a backhoe. The material can be scooped out and placed directly into a dump truck.

Heavy equipment can be used in a similar manner to clean up oil-contaminated snow and ice. Contaminated snow located along the workpad or a highway, or on lake or river ice thick enough to support heavy equipment (at least 3 feet thick), can be removed with a motorized grader or loader. A dump truck or a snow-melter may also be deployed to the spill site. The technique is the same as used for oil-contaminated sand: windrow the material, pick it up, and transport it. Contaminated snow overlaying vegetated areas will be removed in such a manner to minimize damage.

4.3.6.2 Pressurized Equipment

Four types of pressurized systems are useful in removing oil from rocks and man-made structures: hydroblasting, air blasting, sand blasting, and steam cleaning. When these procedures are used to clean rocks, the Environment Department will be consulted to determine, on a case-by-case basis (with the approval of the appropriate state and federal agencies), if these techniques are warranted, since these processes would likely remove all life forms, thus destroying those which survived the spill.

Pressurized equipment can be used to remove the film of oil from man-made structures. Care will have to be exercised to ensure that the cleaning techniques do not do more harm to the surface than leaving the oil in place. Hydroblasting and steam cleaning will create pools of oil below the surface being cleaned and

should always be used in conjunction with sorbents. It is emphasized that pressurized equipment would only be used with prior approval from the state and federal agencies on a case-by-case basis.

4.3.6.3 Manual Methods

The final stages of cleanup for any spill will probably involve hand-cleaning many surfaces, particularly in areas that might be damaged by heavy and pressurized equipment.

Areas that are inaccessible to equipment or which have only small amounts of surface to be cleaned can be cleaned by hand. Hand scrapers and wire brushes can be used to remove oil from rocks and man-made structures. Weathered oil will adhere strongly to a surface.

Small pools of oil can be removed with sorbents, and oil-soaked debris can be cleaned up with shovels and rakes. If they must be left on site for long periods of time, contaminated materials should be placed in impermeable storage containers such as lined pits or steel barrels. Small quantities of oil and oily debris can be placed in bags and piled up for removal. It may be necessary to remove contaminated vegetation and small rocks by hand, particularly along shorelines. Removal of oil and contaminated snow overlying vegetative cover might also require manual methods.

4.3.6.4 Sorbents

There are two classes of sorbents available for oil spill cleanup:

- Commercially available sorbents, packaged as rolls, pads, and booms
- Naturally occurring materials such as snow, peat, and the vegetative mat

Additional commercial sorbents in the form of unconsolidated materials are also available, but once dispensed are difficult to retrieve, expensive to dispose of, and should not be used.

Commercial sorbents must be moved frequently to be effective. Rolls and pads are most efficient if they are turned over when the bottom side is saturated with oil. Sorbent booms should be frequently rolled so that they are thoroughly exposed to the oil. Booms may have to be weighted to ensure that they come in contact with the oil.

The use of sorbents in the winter has generally been found to be ineffective, as the mechanical manipulation that sorbents require is greater than that of other cleanup techniques. The effectiveness of sorbents also deteriorates with weathering.

4.3.6.5 Commercially Available Sorbents

Commercially available sorbents are used during both containment and cleanup operations.

The use of sorbent booms in containment actions is discussed in Section 4.3.4.3. Sorbent booms also can be used to remove light and/or small slicks from ponds and lakes. The boom can be deployed between two boats or held by hand and dragged slowly through the slick. Oil entrained in groundwater may seep for some time at spring lines. A sorbent boom can be deployed downslope from the seep to provide a means of continuous cleanup.

Sorbent pads and rolls are used to clean up residual oil on bodies of water, shorelines, land, and small seeps. Pads can be distributed throughout boggy, marshy, and vegetated areas to remove small pools of oil. They are particularly useful in areas that are sensitive to vehicular traffic, as well as in remote areas.

Sorbents can be distributed during containment operations to absorb small amounts of oil escaping from between the booms. This technique should be used wherever possible to reduce the area of contamination.

4.3.6.6 Naturally Occurring Sorbents

There are two general types of natural sorbents occurring along the pipeline route:

- Snow
- Peat and the vegetative mat

Snow has proven to be a good oil sorbent. The efficiency of snow absorption is much higher at snow temperatures below 0°F. Snow berms that have been constructed to contain a spill also act as cleanup mechanisms. The berms absorbs the spilled oil and can be removed when saturated. Because snow can be continually supplied to a point downslope from a spill and act as a continuous sorbent material, it should be used whenever possible. In addition, snow is easily removed.

Peat and the vegetative mat will act as an in-situ sorbent for spills traversing land. The amount of oil that is absorbed will depend upon the thickness and density of each. The vegetative mat will absorb more oil because it is less dense. Removal of contaminated peat and vegetative mat should be done only with the consent of appropriate experts. Peat should not be removed if underlain by permafrost or highly erodible soils. The vegetative mat should not be removed when underlain by permafrost or other soils designated as sensitive in Section 1.6 of Volume 1.

4.3.6.7 Pumping and Flotation

In addition to skimming, there are two techniques involving pumping that apply to oil spill cleanup:

- Water flooding (flotation)
- Pumping subsurface oily water to the surface

Water flooding is a means of floating oil to the surface where it can be cleaned up with sorbents, skimmers, and booms. In areas where a spill may migrate to significant depths (bogs, sand, gravel bars, elevated pads, etc.), some of the spill may be forced to the surface by water flooding. In bogs and gravel deposits, a dam or sheet metal interception barrier can be installed downslope from the contaminated area, and then water can be pumped onto the area until the groundwater table is raised enough to force the oil to the surface. The oil can then be removed with booms, skimmers, and sorbents. In areas where the contaminated material is more consolidated than bogs and gravel deposits, the water may have to be pumped into the ground through one or more holes drilled into the groundwater table.

Where the oil has migrated to a depth of more than 6 feet, drilling and pumping techniques may have to be employed. Drilling and subsequent pumping of contaminated groundwater require some knowledge of the subsurface hydrology of the affected area. The following have to be determined before actual removal:

- Flow rates within the contaminated aquifer
- Depth of the subsurface flow
- Amount of water being supplied to the aquifer
- Extent of the contamination

The depth of the groundwater table (GWT) can be determined by forcing a tube into the soil layers.

Pumping will lower the GWT, forming a depression that will trap the spilled oil so that it can be pumped out. The size of pumps and rates of pumping are dictated by the rate of groundwater flow, the amount of water replenishing the GWT, and the amount of oil spilled.

The oil and water pumped from the hole will probably be emulsified, due to the pumping action and the confined area through which both have passed. The discharge hose of the pump will be connected directly to containers. Hoses and/or temporary pipelines may be used to provide this connection in cases where the pumping unit and storage containers are some distances apart.

While one receptacle is being filled, the other is being discharged into an oily water separator. Cessation in pumping before all the oil is removed will cause the GWT to resume its former position and allow the once-pooled oil to migrate farther in the aquifer.

Water used for the purposes of flooding and pumping should be properly treated before being discharged. It may be necessary to consult the Environment Department before using local streams, lakes, or rivers as a source of water. In all cases, a permit may be required from the Alaska Department of Fish and Game (ADF&G), the Alaska Department of Environmental Conservation (ADEC), and the Alaska Department of Natural Resources (ADNR). If a portable American Petroleum Institute (API) oil/water separator is available, treated water could be recirculated to flood more water out of a spill area.

4.4 DAMAGED STORAGE TANK TRANSFER PROCEDURES

Pump station tanks over 10,000 gallons are as follows:

- Crude oil relief tanks (one per station)
- Turbine fuel tanks (one or two per station)
- Drag reducing agent (DRA) tank(s)
- Line balancing tanks at PS01
- Gasoline fuel tanks
- Diesel fuel tanks

If any of these tanks are found to be leaking, the following general procedures apply.

4.4.1 Crude Oil Relief Tank(s)

If tank piping is intact, the most expeditious method of emptying the tank will be via the booster pump and mainline crude pumps into the pipeline.

If tank piping is not usable, connect hoses and portable pump(s) to tank shell fittings and route to an empty road tanker truck or portable tanks and bladders. Equipment such as pumps, hoses, and assorted hose fittings and reducers (Kamlock or similar) are readily available in oil spill supplies at each pump station. Flanged fittings, for bolting to the tank, set up to convert to Kamlock or similar hose fittings will be available in the pump station shop or warehouse.

4.4.2 Turbine Fuel Tank(s)

If piping is intact, gravity flow from damaged tank to undamaged tank can be used, if the second tank is at a lower level.

Jumper hoses can be connected at the tank truck's off-loading fuel pumps to pump from tank to tank.

Hoses and portable pump(s) can be connected to pump from the turbine tank into a crude relief tank.

The tank truck off-loading fuel pump skid and piping could be used to gravity flow or pump to an empty road tanker.

Equipment described in Options 2, 3, and 4 such as pumps, hoses and assorted fittings and reducers (Kamlock or similar) are readily available. Fittings, such as the flanged fittings to Kamlock or similar, may be available at the pump stations or at the Fairbanks Fabrication Shop.

4.4.3 Miscellaneous Gasoline and Fuel Tanks

Assorted small vertical tanks and horizontal tanks are generally limited in the opportunities to pump down for leak mitigation. These tanks are much smaller in size from the crude oil and turbine fuel tanks. Side shell fittings are generally not prefitted with valves. If fittings with valves are available, the preferred method of emptying the tank will be via hoses, portable pumps, and empty tank truck or portable containers.

Equipment to accomplish this option is readily available from pump station oil spill equipment stocks. If conversion pieces from flanges to Kamlock-type fittings are not available, they can be acquired from the Fairbanks Fabrication Shop.

4.4.4 Drag Reducing Agent (DRA) Tanks

These tanks are generally International Maritime Organization (IMO) truck tanks. Hoses and portable pumps can be set up to pump from damaged tank to undamaged tank. Leaking fixed tanks can be pumped into portable truck tanks.

4.5 RECOVERED OIL TRANSFER, STORAGE, AND DISPOSAL

4.5.1 Introduction

This section deals with recovered oil and waste streams that may be generated as a result of oil spill response and cleanup activities. The majority of the recovered oil and waste streams likely to be generated in an oil spill response have been pre-identified and, based on this pre-identification, management options can be established. Some wastes may require testing if knowledge of the waste stream is not adequate to characterize the waste.

4.5.2 Incident-Specific Recovered Oil and Waste Management Plan

This section addresses the general approach for managing recovered oil and the different waste categories that may typically be encountered during an oil spill response. An incident-specific Recovered Oil and Waste Management Plan will be developed to set specific methods for managing recovered oil and waste streams during oil spill response and cleanup activities.

The Environment Unit Leader is responsible for preparing this incident-specific Recovered Oil and Waste Management Plan, in consultation with the Operations Section. The ADEC representative responsible for waste management activities in the response should also be consulted by the Environment Unit Leader during development of the incident-specific Recovered Oil and Waste Management Plan. The Environment Unit Leader submits the completed Recovered Oil and Waste Management Plan to the ADEC waste management representative for review and approval by the State On-Scene Coordinator (SOSC). The approved plan should be distributed to supervisory personnel responsible for recovered oil and waste management activities. Workers involved in oil recovery and waste management activities need to be briefed on elements of the plan specific to their areas of responsibility.

During the course of spill response and cleanup, the Recovered Oil and Waste Management Plan needs to be updated as new waste streams are encountered and/or methods change for managing recovered oil and waste. The Environment Unit Leader is responsible for preparing necessary plan amendments and submitting the amendments to the ADEC waste management representative for review and approval by the SOSC.

4.5.3 Recovered Oil and Waste Categories

Table 4-1 presents a summary of the recovered oil and waste categories that may be generated during oil spill response and cleanup activities and gives examples of specific waste streams for each waste category.

4.5.4 Waste Identification and Characterization

Alyeska has experience in dealing with most of the recovered oil and waste categories shown in Table 4-1. Waste generated as a result of an oil spill response are similar to waste generated during routine TAPS operations and maintenance activities.

TABLE 4-1
RECOVERED OIL AND WASTE MANAGEMENT CATEGORIES
EXPECTED FROM OIL SPILL RESPONSE ACTIVITIES

CATEGORY	EXAMPLES	
Recovered Oil	• Free product • Product containing debris • Decant water	• Product containing water • Product recovered from processing
Oily Liquids	• Oily water • Engine oil • Hydraulic oil	• Bilge water • Fuels contaminated with water • Decontamination waters
Oily Solids	• Spent sorbents • Personal Protective Equipment • Oiled response equipment • Oil contaminated sand, gravel, and soil	• Oily debris • Riverbank debris • Empty drums/containers • Oil contaminated vegetation
Solid Waste/Garbage	• Food waste • Paper • Trash	• Equipment • Construction materials • Debris (non-oiled)
Hazardous and Other Regulated Waste	• Sorbents and PPE with fresh crude oil • Batteries • Solvents • Aerosol cans • Coolant filters	• Laboratory waste • Light bulbs • Drager tubes
Domestic Wastewater	• Toilet facilities (portable toilets) • Gray water	• Sewage
Other Wastewaters	• Secondary containment runoff • Firefoam • Excavation dewatering	• Storm water runoff • Hydrostatic testing
Animal Carcasses	• Oiled birds and mammals	• Oiled and non-oiled fish

4.5.4.1 Waste Characterization

The analytical testing program for soils, sorbents, and debris contaminated with fresh crude oil would be included in the Incident-specific Recovered Oil and Waste Management Plan. Representative samples for waste characterization would be collected in accordance with SW-846, Chapter 9, or an Incident-specific Waste Analysis Plan. Soils, sorbents, and debris contaminated with fresh crude oil may exhibit a hazardous waste characteristic for benzene during the first days of a spill response. After the first few days of a spill, this characteristic is largely lost due to the evaporation of volatile hydrocarbons. As a result, analytical testing of soils, sorbents, and debris contaminated with fresh crude oil may be necessary during the initial spill response phase.

4.5.5 Hazardous Waste Requirements Related to Spill Response

Hazardous waste regulations within the Resource Conservation and Recovery Act (RCRA) provide a temporary exemption from certain hazardous waste requirements during the immediate response phase [40 CFR 265.1(c)(11)(i)(C)], including treatment and container requirements. The immediate response phase is the time period from immediate reaction to the spill through immediate control and containment, plus a reasonable time to comply with the requirements. This reasonable time to comply with requirements is to allow for containers to be brought on site, the waste to be placed in appropriate containers, and transportation of the waste to a storage area.

With the exception of the requirements for treatment, containers, and transportation identified above, all other hazardous waste requirements apply during the immediate response phase. After the immediate response phase of a spill response, the exemptions for treatment, containers, and transportation are no longer available and hazardous waste must be managed in accordance with applicable requirements of the RCRA.

Most existing Alyeska commercial transporters are licensed to transport hazardous waste. In the event a transporter is not licensed, the Federal On-Scene Coordinator (FOSC) has the authority [40 CFR 263.30 (b)] to determine that the immediate removal of oily waste and potentially hazardous waste for the duration of the spill response is necessary to protect human health and the environment and *can authorize the removal of these waste by transporters that do not necessarily have EPA identification numbers and without the need to prepare or use a manifest.* The Environment Unit Leader is responsible for preparing the request to the FOSC for this authorization, if needed.

An EPA generator identification number must be obtained for the spill response area if hazardous waste is expected to be generated. The Environment Unit Leader is responsible for obtaining the EPA generator identification number. Most TAPS facilities already have EPA generator identification numbers that may apply if the spill was at one of these facilities. In addition, a RCRA Contingency Plan and Emergency Response Procedure may need to be prepared for wastes generated during the spill response. The Environment Unit Leader is responsible for preparing an Incident-specific RCRA Contingency Plan and Emergency Response Procedure, if required.

Hazardous and other regulated waste generated during oil spill response activities would be transferred to a designated waste staging area(s), stored in properly labeled containers and inspected weekly. Testing of wastes would be conducted as necessary. Hazardous waste must be shipped to an out-of-state Treatment, Storage, or Disposal (TSD) Facility for energy recovery or disposal. Other regulated waste (e.g., asbestos, PCBs, radioactive exit signs, etc.) must be managed in accordance with applicable requirements for the waste stream. Information on hazardous waste and other regulated waste management is contained in EN-43-006.

4.5.6 Recovered Oil and Waste Management

Table 4-2 provides information on typical management methods for recovered oil and waste categories for a spill response. The table provides information on the generation source, initial containment at the source, and transfer, staging, recovery, or disposal. This table is an example and identifies specific methods to be used for an actual spill response.

Additional information and considerations for the management of recovered oil and wastes generated during a spill response are provided below.

4.5.6.1 Recovered Oil

Recovered oil and oily water would be collected from portable tanks and natural or constructed containment by vacuum trucks or other suitable tank trucks. Recovered oil would be transported to an appropriate location for injection into the pipeline. Oil and oily water that cannot be injected into the pipeline due to the debris content would be transported to a designated staging area specified in the Incident-specific Recovered Oil and Waste Management Plan. The oil would be screened or processed through a filter or centrifugal unit to remove debris. The oil would then be transported to an appropriate pipeline location for injection.

Oil and oily water recovered during a spill response will initially be held in portable tanks (e.g., open top tanks, fast tanks, bladders, or other suitable storage containers) or in natural or constructed containment areas at the spill scene.

Decanting of water from skimmers and storage containers and/or containment is necessary to maximize the storage capacity for recovered oil and oil/water mixtures. Decanting is accomplished by gravity flow through a container drain fitting or with a portable pump taking suction at the lowest possible level of the container or containment. Decanted water is discharged back to the river, stream, or lake at a point ahead of the skimmer and within the collection boom. Decanting is controlled by a visual standard of clear water (i.e., no oil sheen). The person controlling decanting must view the decant discharge stream and stop decanting as soon as discoloration of the discharge stream is seen. Decanting is at the skimmer operator's discretion, provided that these requirements are followed.

Modifications to these decanting requirements may be initiated by the SOSC. If a modification is requested, an incident-specific decanting application and plan would be developed by the Environment Unit Leader, in consultation with the Operations Section, and submitted to the SOSC for approval.

TABLE 4-2
RECOVERED OIL AND WASTE MANAGEMENT FOR SPILL RESPONSE ACTIVITIES

WASTE CATEGORY	SPECIFIC WASTE	GENERATION SOURCE	INITIAL CONTAINER AT SOURCE	TRANSFER, STAGING, RECOVERY, OR DISPOSAL
Recovered Oil	1. Recovered crude oil. 2. Collected oily water.	Oil recovery sites	Vacuum trucks and portable tanks	Transfer to vacuum or tank trucks; gauge oil content. Depending upon debris content haul to pump station or other pipeline location for storage and injection or to designated staging area for processing (screening, M-I Unit, or similar centrifugal unit) prior to hauling to pump station or other pipeline location.
	Decant water	Oil recovery and cleanup sites	Oil skimmers, portable containers, containment areas	Decant at lowest level in containers back to at a point ahead of skimmer within collection boom. Controlled by skimmer operator to visual standard of clear water (i.e., no oil sheen). Decanting application and plan may be required by SOSC.
Oily Liquids	Oily waters with or without recoverable quantities of oil	Oil recovery, cleanup, and decon sites	Vacuum trucks and portable containers.	**Recoverable oil:** Transfer to vacuum or tank trucks; gauge oil content. Depending upon debris content haul to pump station or other pipeline location for storage and injection or to designated staging area for processing (screening, M-I Unit, or similar centrifugal unit) prior to hauling to pump station or other pipeline location. **No recoverable oil:** Small volumes may be injected into the pipeline with OCC authorization
	Engine oil, hydraulic fluid, contaminated fuels	Equipment	Drums or other suitable containers	Transfer to designated waste staging area. Haul to pump station for injection after authorization.
	Firefoam used for vapor control or fire control	Spill site	Vacuum trucks and portable containers	Transfer to vacuum or tank trucks; gauge oil content. Notification and authorization needed for injection. Depending upon debris content haul to pump station for storage and injection or to designated staging area for processing (screening, M-I Unit, or similar centrifugal unit) prior to hauling to pump station.
Oily Solids	Spent sorbents, PPE, sludge, damaged equipment	Oil recovery, cleanup, and decon sites	Clear bags or dumpsters for large objects	Transfer to designated waste staging areas; test, as needed: non-hazardous to commercial incineration or energy recovery facility; hazardous to Treatment, Storage, or Disposal (TSD) facility
	Contaminated soil	Oil recovery, cleanup sites	Trucks with lined beds	Haul to a designated contaminated soil stockpile; recoverable oil content: to thermal desorption or disposal: commercial incinerator.
	Vegetation and debris	Oil recovery, cleanup sites	Trucks with lined beds	Haul to designated waste staging area; on-site open burning or air-curtain incinerator; off-site: to commercial incinerator.
Domestic Wastewater	Sewage and gray water	Portable toilets (waste collected from portable toilets can only go to POTWs)	Collected by sewage pumping contractor	Publicly Owned Treatment Works (POTW)
		Camp for crew housing	–	Camp sewage treatment plant. May need ADEC plan review and approval and Notice of disposal
Other Wastewaters	Excavation dewatering and hydrotest water	Uncontaminated areas	–	Notice of disposal and application fee to ADEC for authorization for discharge in accordance with limits in NPDES Permit AK-005056-8.
	Oily wastewater	Oil recovery and cleanup sites	Removal of visible sheen and contaminants prior to discharge	Submit request for SOSC authorization to discharge to upland areas.
	Storm water	Disturbed areas	Control sediment in runoff.	Submit Notice of Intent to discharge storm water if greater than 5 acres disturbed by response and remediation activities and reaches waters of the United States. Prepare a Storm Water Pollution Prevention Plan.
	Secondary containment discharge water	Secondary containment areas	Visually inspect for oil; remove oil; if sheen after treatment, sample	Discharge to land
Solid Waste/ Garbage	Domestic garbage, trash, and debris	Break areas, camp, response areas	Clear or blue bags	Dumpsters in designated storage area; haul to Municipal landfill
Hazardous and Other Regulated Waste	Batteries and other spill cleanup materials	Equipment	Covered containers with labels	Transfer to designated waste staging area; to TSD facility
Animal Carcasses	Oiled and non-oiled animal carcasses. Oiled fish carcasses	Oil spill recovery and cleanup areas.	Clear bags	Refrigeration van, to agencies

4.5.6.2 Oily Liquids

The management of oil/water mixtures depends upon the quantity of oil in the mixture and the total volume.

Engine oil, hydraulic fluids, and contaminated fuels meeting TAPS injection criteria (see EN-43-006) may be injected into the pipeline. The Environment Leader, in consultation with the Operations Control Center, would determine whether these types of petroleum products can be injected.

Firefoam used for vapor control and fire control and mixed with crude oil during a spill response is acceptable for injection into the pipeline system with authorization by the Environment Unit Leader and prior notification to OCC.

4.5.6.3 Oily Solids

Oily solids contaminated with fresh crude oil can exhibit a hazardous waste characteristic for benzene. The management of oily solids, such as sorbents and personal protective equipment (PPE), depends upon whether the waste is hazardous or non-hazardous. Sorbents and PPE contaminated with fresh crude oil must be transferred to a designated waste staging area(s) for management. Heavily oiled and lightly oiled material is segregated. Sampling is conducted on the oiled waste to confirm its hazardous waste characteristic. Techniques (e.g., presses) to recover crude oil from the materials may be used at a designated staging area(s). Recovered oil would be placed in containers for subsequent injection into the pipeline system. Sorbents and PPE that are hazardous waste must be shipped off-site to a Treatment, Storage, or Disposal (TSD) Facility.

Non-hazardous oily solids, such as sorbents, PPE, and equipment, would also be transferred to a designated waste storage area(s). Non-hazardous oily solids would be disposed at a permitted solid waste disposal facility.

An incident-specific Contaminated Sites Emergency Response Phase Plan would be prepared for management of contaminated soils during spill response activities. The plan would be submitted to ADEC for review, and approved by the Unified Command. Soil excavated from spill recovery, repair, and cleanup activities would be segregated into “clean” and “contaminated” based on criteria established for the spill response. “Clean” and “contaminated” soils would be segregated. Clean soils would eventually be used as on-site backfill or for other uses.

Petroleum-contaminated soils would be stockpiled in a designated waste storage area(s). The contaminated soil stockpile would be sized to accommodate the quantity of contaminated soils expected. Stockpiles would be built and maintained in accordance with the Alyeska Line-Wide Petroleum-Contaminated Soil Stockpile Management Plan. Stockpiles expected to be used less than 180 days must meet the requirements of the Line-wide plan, with the exception that a 10-mil bottom liner may be used instead of 20-mil bottom liner. If sufficient quantities of recoverable oil are in the contaminated soils, thermal desorption or similar technology may be used to recover the oil for subsequent injection into the pipeline. If there are not sufficient quantities of recoverable oil in the contaminated soils, then the soils could be treated in an ADEC-permitted commercial soil incinerator.

Oily vegetation would be segregated from contaminated soils to the extent possible and stored in a separate stockpile in a designated waste staging area(s) until disposal at a permitted solid waste disposal facility.

4.5.6.4 Non-Oiled Solid Waste/Garbage

Solid waste from an oil spill would be placed in plastic bags and sealed. Domestic garbage would be segregated from construction and demolition debris. Solid waste bags would be placed in a vehicle (e.g., lined truck bed) and transferred to a designated waste storage area as soon as a sufficient quantity of waste is collected. Solid waste that is too large for plastic bags would be segregated into properly marked dumpsters and transferred to a designated waste staging area. The waste storage area(s) to be used in a spill response would be identified in the incident-specific Recovered Oil and Waste Management Plan.

4.5.6.5 Domestic Wastewater

Domestic wastewater would be discharged to a sewage treatment plant (STP) or portable toilets would be used at oil spill recovery and cleanup sites. The portable toilets would be periodically pumped out and the sewage hauled to a sewage treatment plant designated in the incident-specific Recovered Oil and Waste Management Plan.

If a camp is set up to provide lodging and meals for response workers (e.g., MCCF), a package sewage treatment plant could be used for treatment of domestic wastewaters generated from camp operations. If the camp and associated STP have already been through ADEC plan review and approval, a notice of disposal and applicable application fee would be provided to ADEC in accordance with the Linewide NPDES General Wastewater Permit (AK-005056-3). Otherwise, ADEC plan review and approval would be necessary for operating the sewage treatment plant. See EN-43-004 for information on notices of disposal and ADEC plan review and approval.

4.5.6.6 Other Wastewater

Excavation dewatering and hydrotesting waters may be covered by the Linewide NPDES General Wastewater Permit (AK-005056-3) for non-oily wastewater discharges. See EN-43-004 for discharges covered in this permit or contact the Environment Unit. A notice of disposal and application fee must be submitted to ADEC for covered discharges.

Large volumes of oily wastewaters without recoverable oil content may need to be discharged to upland areas. Three options are available for authorizing discharges of large volumes of oil contaminated water:

- Submit a Linewide Wastewater Disposal Permit application to ADEC for SOSC authorization for a variety of wastewaters;
- Submit a Notice of Disposal under an existing ADEC General Wastewater Disposal Permit to ADEC for SOSC authorization; and
- Submit an incident-specific ADEC Wastewater Disposal permit to ADEC for SOSC authorization.

Treatment of the wastewater discharge would likely be required for any of the three options, including settling, removal of sheen (sorbents or other methods), potential treatment through the Calgon filter unit (staged at North Star Terminal), and analytical testing. The Environment Unit Leader, in consultation with the Operations Section and ADEC, would determine the most appropriate option based on spill conditions. The Incident-specific Recovered Oil and Waste Management Plan would document the option selected.

An APDES General Permit for Discharges from Large and Small Construction Activities AK-R-10-0000 applies in the event that more than 1 acre would be disturbed during spill response, cleanup, and remediation activities and storm water runoff would reach waters of the United States. A Notice of Intent and Storm Water Pollution Prevention Plan would be required. See EN-43-004 for more information.

Discharge waters from secondary containment areas would be visually inspected for oil and any oil sheen removed prior to discharge to land. If oil sheen needs to be removed, sampling of the discharge for total petroleum hydrocarbons (TPH) and total aqueous hydrocarbons (TAqH) is required. Alyeska Form 3729 would be completed for each secondary containment discharge event.

4.5.6.7 Animal Carcasses

Animal carcasses would be collected and handled separately from solid waste. When dead animals are found response workers would tag and bag them according to instructions and set them aside for collection by qualified personnel from wildlife capture teams. Refrigeration vans would be needed for storage of the animal carcasses.

Non-oiled dead fish encountered by response workers would be left undisturbed. Oiled fish would be bagged, segregated from other waste streams, and shipped to a designated waste staging area(s). Resource agencies would be consulted to determine if some or all oiled fish need to be made available for inspection prior to freezing or refrigeration.

Animal carcasses released by agencies for disposal would be handled as oily solids and incinerated. Oiled animal carcasses would not be disposed of without specific authorization from the applicable resource agency.

4.5.6.8 Burn Residue Collection

Collecting and disposing of burn residue starts after the residue has cooled sufficiently to avoid a flashback fire. Proper safety procedures and personal protective equipment are required. The type and amount of residue from an in-situ burn of oil on water depends on the oil type, condition, and the way in which the oil has been contained throughout the burn.

Residue may be an inch or more thick and will consist of taffy-like layers of weathered, viscous material that is relatively buoyant. Shortly after cooling, most residue is buoyant, however over time the residue will lose its buoyancy. The buoyant burn residue can be released to secondary collection booms or nets. Residue is removed from containment using large strainers or hand tools, with viscous-oil sorbents, or with viscous-oil skimmers. Residue from burning oil on ice is manually recovered from the surface of the ice. Drums and plastic bags can be used for temporary storage of the collected residue. Testing is necessary to ensure that the residue is not hazardous.

4.5.7 Designated Waste Staging Area(s)

A temporary staging area would be required to store recovered oil and waste collected during spill recovery and cleanup activities. More than one staging area may be needed. A staging area may need to be separated into several operating areas to segregate recovered oil and waste. This segregation minimizes the potential for cross-contamination and provides an opportunity for recycling and source reduction. The number and size of segregated storage areas within a staging area depends upon waste types and quantities of waste generated during spill recovery and cleanup activities, but could include separate areas for recovered oil, oily solids (dumpsters), hazardous waste, non-oily waste (dumpsters), contaminated soils stockpile, and other waste categories.

The waste staging area(s) to be used for spill recovery and cleanup activities will be designated in the incident-specific Recovered Oil and Waste Management Plan. Once a staging area location(s) has been established, the site must be prepared to prevent oil contamination of the native soil. A berm should be constructed around the perimeter of the staging area. See Figure 4-37 for a typical layout of a waste staging area. Suitable soils would be imported to construct the berm. A liner would be spread over the staging area and berm and then another layer of soils would be placed over the liner to protect the liner from damage by equipment. Entrance and exit ramps should be constructed over the berm and liner to allow cleanup equipment access to the site.

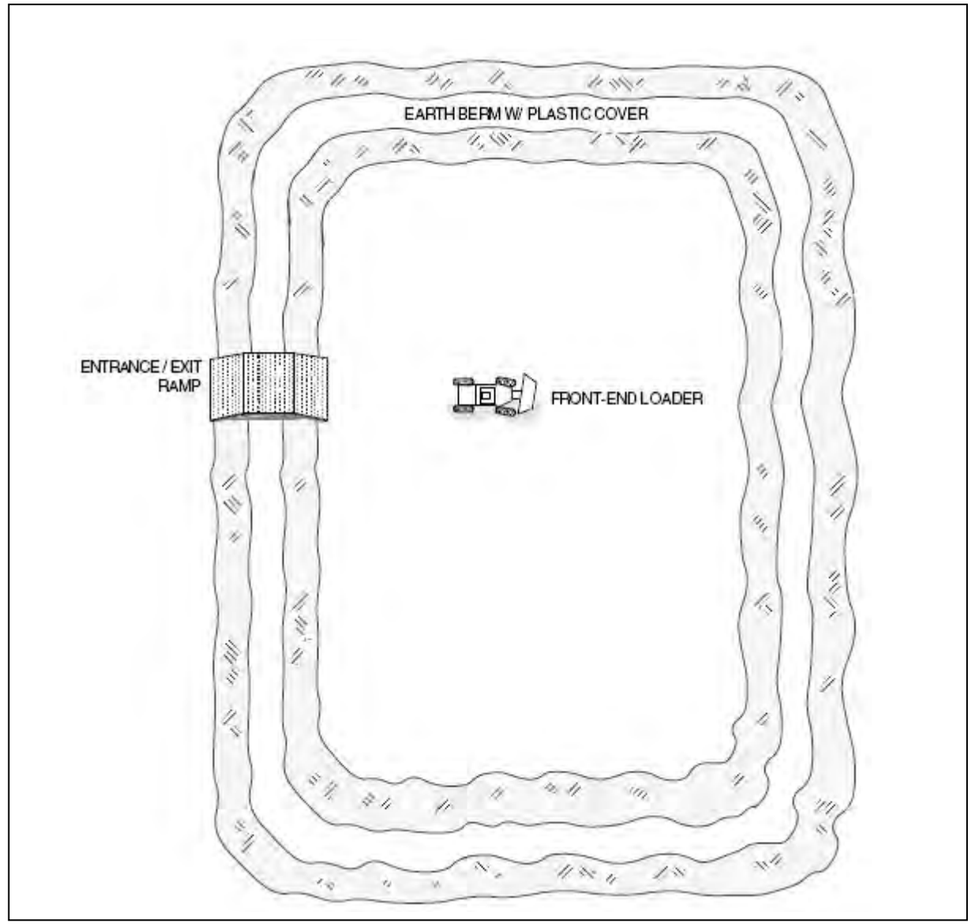


FIGURE 4-37 TEMPORARY WASTE STORAGE SITE

4.5.8 Estimating Amount of Recovered Oil

Alyeska uses three methods for estimating the amount of recovered oil collected during a spill response.

4.5.8.1 Tanker Strapping Charts

Recovered oil volumes collected in highway tankers are estimated using the vendor-provided strapping charts for each tanker. A ruler or stick is used to measure depth of oil and the result is correlated to the strapping tables to determine oil levels and volumes. Tank quantities are recorded and tanks labeled with date and quantity. For over-road transport, tankers are also manifested with volume information. Volume estimates can be verified when offloading into sumps or when re-injecting into the pipeline via the oil metering skid.

4.5.8.2 Sump Injection

Recovered oil volumes collected in facility sumps are estimated as follows. Prior to offloading any recovered oil, the sump is pumped down to a known level (for example, 1 foot) and the sump gage level reading is recorded in the sump injection log. Recovered oil is then offloaded into the sump up to a predetermined level (for example, 3 feet). Another reading is taken from the sump gage and recorded on the log. The total offloaded volume is then calculated from the level readings and recorded on the log.

4.5.8.3 Oil Metering Skid

Recovered oil volumes are measured using Alyeska's Micro Motion Elite 3000 series Coriolis meter. A core processor provides the net oil computer with accurate measurements of crude oil and water content and totals these measurements into a precise total volume. Initially recovered crude oil is filtered through a 1,000-gallon screened tank to remove gross contaminants, then through a Smith E-type quad filter to remove smaller particulates. The meter skid has a flow rate of 200 gallons per minute, is highly portable and can be brought to a spill site and can inject into sumps, containment tanks, portable pipelines, or tanker trucks.

4.5.9 Air Monitoring for In Situ Burn

A surveillance program must be activated to ensure the operation and smoke plume do not impact human populations or mechanical recovery operations. The USCG-recognized Special Monitoring of Applied Response Technology (SMART) procedures must be followed. The SMART protocol states that visual surveillance is first used on the smoke plume and this can be by eye and a camcorder. If it appears that the plume will impact a population center, then monitoring equipment is required. The effectiveness of burning must also be tracked. Results from surveillance of the plume and effectiveness are reported to the Situation Unit based on the reporting schedule established by the Incident Management Team or permit conditions. Issues of concern, such as smoke threatening a village, will be reported immediately. The report typically includes an estimate of amount of oil burned, the location of burn, duration, wind direction, plume characterizations, amount of residue, and condition of boom.

4.6 BIRD AND TERRESTRIAL MAMMAL HAZING

This section discusses certain tactics that may be used for bird and terrestrial mammal hazing to prevent animals from becoming oiled. Because detailed and specific procedures for hazing cannot be formulated in advance, it is the responsibility of the Wildlife Unit Leader with coordination from the ADF&G and the USFWS to develop and organize the appropriate preparedness for preventing contamination of animals through hazing. Alyeska's 2005 *Wildlife Hazing Plan* is provided to the ADF&G in support of their permit renewal requests for hazing of terrestrial mammals and birds for TAPS. This section is divided into four subsections:

- Species Requiring Hazing
- Hazing Methods
- Agency Notification Procedures
- Post-Incident Report

4.6.1 Species Requiring Hazing

Specific birds and mammals that may require hazing are identified in the *Environmental Atlas of the Trans Alaska Pipeline System* (EA-119) which lists the important wildlife use areas along the TAPS corridor, including caribou and moose calving areas, polar bear denning areas, waterfowl concentration areas, waterfowl nesting areas, and wildlife winter use concentration areas.

Birds. Many species of birds use habitats or nest in areas near or crossed by the pipeline system. Water birds, including loons, swans, geese, ducks, and shorebirds dominate. Bird species that have special protection and that use habitats near or crossed by the pipeline system are the peregrine falcon, bald eagle, golden eagle, and spectacled and Steller's eiders.

Mammals. Terrestrial mammal species of primary concern are caribou, musk-ox, moose, grizzly (brown) bear, black bear, Dall sheep, bison, mountain goat, arctic fox, and red fox. Hazing will not be attempted for other mammals. In potentially hazardous encounters with wildlife, the safety of hazing personnel will take precedence over the possible impact of oil to wildlife (for example, in a situation where hazing personnel could contract rabies from foxes).

Caribou, musk-ox, moose, and brown bear will be hazed only on a case-by-case basis in consultation with the ADF&G.

4.6.2 Hazing Methods

The primary response in protecting birds or mammals from an oil spill is to prevent the oil from reaching areas where birds or mammals are concentrated. Mechanical containment and recovery utilizing booms and skimmers, heavy equipment, and *in situ* burning (if permitted) can be used. An additional component of the primary response is to remove dead, oiled wildlife that may be present to avoid attracting scavengers to the site.

Birds

The devices and techniques associated with bird deterrence can be grouped into the following general methods: visual, auditory, or a combination of the two. The choice of an appropriate method depends on the species involved, the surrounding environment, the spill situation, and time of year. A summary of bird hazing techniques and their applicability is provided in Table 4-3. General guidelines for selecting bird deterrent methods are provided below.

- Scarecrows, helium-filled balloons, and Mylar tape can be used to deter birds from landing in oiled areas.
- Where waterfowl, shorebirds, and raptors are dominant, use exploders to disperse birds.
- Flightless birds (young and molting birds) may need to be herded with boats and/or vehicles.
- Where diving birds are dominant, underwater sound (if effective) could be used.

TABLE 4-3
SUMMARY OF BIRD HAZING TECHNIQUES

CATEGORY	TECHNIQUE	APPLICABILITY	ALYESKA EQUIPMENT
Visual Methods	Floating or Stationary Figures	• Human effigy has been shown effective during daylight.	Scarecrows
	Helium-Filled Balloons	• Can prevent birds from landing in fields and on water.	Helium-Filled Balloons
	Mylar Tape	• Can prevent birds from landing.	Mylar Tape
Auditory Methods	Propane Cannons	• Bird density reduction ranges from 50% to 100%, depending on species. • Works for only 2 to 3 days. • May not be effective in rough open water conditions.	Propane exploder cannons Pyrotechnics
Visual and Auditory Methods	Herding with Boats	• Slow and labor-intensive. • May be effective with flightless waterfowl, but ineffective for diving birds.	Small boats available for summer use

Adapted from Alaska Regional Response Team. 2002. *Wildlife Protection Guidelines for Alaska.*

Mammals

The devices and techniques associated with wildlife deterrence can be grouped into the following general methods: visual, auditory, pain (e.g., rubber bullets), combinations of the three, and exclusion techniques utilizing fencing, netting, or gridding. The choice of an appropriate method depends on the species involved, the surrounding environment, the spill situation, and time of year. A summary of mammal hazing techniques and their applicability is provided in Table 4-4. General guidelines for hazing mammals are provided below.

- Hazing of ungulates (hoofed mammals) would involve either surface or aerial methods. Alyeska hazing equipment and Alaska Clean Seas (ACS) hazing kits (see Section 2.4.3) can be used for individual and small groups of animals, including small musk ox herds that should be prevented from forming protective circles and encouraged to move away from the spill.
- Alyeska will seek guidance and assistance from the ADF&G in utilizing the most appropriate technique for hazing bears.
- Alyeska may install scarecrows, snow fences, or electric fences around isolated spill areas, field camps, staging areas, waste disposal sites, or other selected areas.

The distance from the spill site, staging area, and other areas at which hazing of mammals would begin and end would be determined on a case-by-case basis. Hazing distances would depend upon specific factors that include the species involved, spill location, type of spill incident, and weather conditions. In some cases, it may be advantageous to haze animals at a considerable distance from the spill site. For example, a large herd of caribou harassed by insects may be deflected a few degrees at a considerable distance from the spill site and with perhaps a minimal effort so the herd would not encounter the spill site. Conversely, it may be nearly impossible without considerable effort, if at all, to move the same herd in a desired direction once it is within a few hundred feet of the site.

TABLE 4-4
SUMMARY OF MAMMAL HAZING TECHNIQUES

SPECIES	TECHNIQUE(S)	COMMENTS
Bear	• Pyrotechnics	
	• Propane exploder cannons	
	• Helicopters	
	• Airboats	
	• Ground transportation (Snow machines, ATVs, trucks)	
	• Rubber bullets	
	• Fences	Effective for isolating small spill areas, field camps, etc.
Caribou	• Pyrotechnics	Most effective on individual animals or small groups.
	• Propane exploder cannons	Most effective on individual animals or small groups.
	• Helicopters	Most effective on herds
	• Airboats	Most effective on herds
	• Ground transportation (Snow machines, ATVs, trucks)	Most effective on herds
	• Rubber bullets	
	• Fences (electrified)	
	• Fences	Effective for isolating small spill areas, field camps, etc.
Moose	• Pyrotechnics	
	• Propane exploder cannons	
	• Helicopters	
	• Airboats	
	• Ground transportation (Snow machines, ATVs, trucks)	
	• Rubber bullets	
	• Fences	Effective for isolating small spill areas, field camps, etc.
Musk Oxen	• Pyrotechnics	For all non-passive hazing techniques. Must ensure that animals are not hazed to the point that they form a defensive ring.
	• Propane exploder cannons	
	• Helicopters	
	• Airboats	
	• Ground transportation (Snow machines, ATVs, trucks)	
	• Rubber bullets	
	• Fences	Effective for isolating small spill areas, field camps, etc.

Developed with the assistance of Paul O'Neil, U.S. Department of Agriculture.

4.6.3 Agency Notification Procedures

In the event of a spill requiring hazing operations, the trustee agencies listed in Table 4-5 will be notified within 24 hours of initiating a wildlife hazing program. If agencies cannot be reached, notification efforts will continue and will be logged.

Alyeska will submit the ARRT's wildlife hazing checklist within the first 24 hours following initiation of hazing activities, in accordance with the *Wildlife Protection Guidelines for Alaska* (ARRT, 2002). The most current copy of the checklist can be obtained from the ARRT web site (www.akrrt.org/index.html).

4.6.4 Post-Incident Report

In the event of an incident requiring hazing, a written report will be submitted to ADF&G in a time period consistent with the terms of the permit. The report will include species, numbers, dates, techniques used, locations, disposition, observed success or problems encountered, and other information as required.

TABLE 4-5
PRIMARY ROUTES OF NOTIFICATION

NOTIFIED POSITION	NAME OF RECIPIENT	PHONE NUMBER[1]
Wildlife Unit Leader	Ken Wilson David Schmidt Macnamara Shoulders	(907) 450-5732 (907) 787-7682 (907) 787-7910
Environmental Coordinators	Cathy Girard Kate Montgomery	(907) 787-4185
	Jim Lawlor	(907) 787-7682
Alaska Clean Seas, Deadhorse	Person on shift	(907) 659-2405
Alaska Wildlife Response Center (IBRRC -Alaska) Director of Response Services	Barbara Callahan	(907) 562-1326 (707) 207-0380 24 hours
International Bird Rescue Research Center, Berkeley (IBRRC)	Barbara Callahan	(907) 562-1326 work (b) (6) cell cell (907) 277-4956 fax
	Jay Holcomb	(707) 207-0380 work (b) (6) home cell (707) 207-0395 fax
	Curt Clumper	(206) 527-0376 work (206) 527-0376 fax
Bird Treatment and Learning Center	Main Office	(907) 562-4852
Oasis	Dave Trudgen	(907) 258-4880 work (b) (6) home cell
U.S. Dept. of Interior	Pamela Bergman	(907) 271-5011 (b) (6) cell
	Doug Mutter	cell
U.S. Fish & Wildlife Service	Catherine Berg, primary	(907) 271-1630 work (b) (6) home cell (907) 271-2786 fax catherine_berg@fws.gov
	Philip Johnson, alternate	(907) 786-3483 work (b) (6) home cell (907) 786-3350 fax philip_Johnson@fws.gov
Alaska Department of Fish and Game	Mark Fink, primary Todd Nichols, alternate	(907) 267-2338 work (b) (6) home cell (907) 267-2464 fax (907) 459-7363 work (907) 456-2259 fax
JPO DNR Habitat	Dennis Gnath	(907) 257-1307

[1] All phone numbers are for Anchorage unless otherwise noted. Note that updates to the position titles and telephone numbers may be found in Alyeska's Emergency Telephone List, distributed quarterly.

4.7 SHORELINE CLEANUP TECHNIQUES

4.7.1 Shoreline Cleanup Using Flooding and Flushing

Physical removal involves a variety of washing or flushing tactics to move oil from the shore zone to a location for collection and removal. The variables that distinguish each tactic are pressure and temperature. For all these tactics, booms or other methods of trapping and containment are used to collect the oil for removal.

4.7.1.1 Flooding (“Deluge”)

A high-volume (50 to 250 gpm), low-pressure supply of water at ambient temperature is pumped using large-diameter (3- to 6-inch) pipe and/or hose (“header”) to the upper section of the oiled area. Water can be pumped either directly from a hose without a nozzle, or the pipe or hose can be perforated (0.1- to 0.2-inchholes) at intervals and placed along the shoreline parallel to the water line. Output pressures are less than 20psi.The high volume of water floods the surface area (in the case of impermeable man-made shorelines) or the beach sediments. Mobile or non-sticky oil is transported with the water as it flows downslope. Flooding can be used in combination with trenches or sumps and vacuum systems to float and collect oil for recovery.

4.7.1.2 Low-Pressure, Cold-Water Flushing

Hand-operated or remote-controlled hoses use ambient temperature water to flush, wash, and herd oil to a collection point for removal. Output pressures are controlled, usually by a nozzle, and are low (less than 50psi). The tactic can be used with flooding to prevent redeposition of the oil.

4.7.1.3 Low-Pressure, Warm/Hot-Water Flushing

Hand-operated or remote-controlled hoses use heated (80F to 212F) water to flush, wash, and herd oil to a collection point. This tactic is used primarily to dislodge and flush oil that cannot be washed using low-pressure, ambient-temperature water. Output pressures are controlled, usually by a nozzle, and are low (less than 50 psi). This tactic can be used with flooding to prevent redeposition of the oil.

4.7.1.4 High-Pressure, Cold-Water Flushing

Hand-operated or remote-controlled hoses use ambient temperature water jets to flush, wash, and herd oil to a collection point. The higher water pressures dislodge and flush oil that cannot be washed or mobilized using lower pressure, ambient temperature water. Output pressures are controlled and are in the range of 100psi or greater. On sloping outcrops or structures this technique can be used with flooding to prevent redeposition of the oil.

4.7.1.5 High-Pressure, Warm/Hot-Water Flushing

Hand-operated or remote-controlled hoses use high-pressure, heated (80F to 212F) water to flush, wash, and herd oil to a collection point. Output pressures may be fixed or controlled by a nozzle and are in the range of 100 psi or greater. The higher pressure and warm water dislodge and flush oil that cannot be washed by lower pressure and temperature water. On sloping structures, this technique can be used with flooding or low-pressure flushing to prevent redeposition of the oil.

4.7.1.6 Deployment Considerations and Limitations•

Unified Command approval is required for any shoreline cleanup tactic.

Washing oil and/or sediments downslope to lower intertidal zones that may have plant or animal communities should be avoided, particularly if these were not initially oiled. This can be avoided by working at only mid-tide or higher water levels so that these communities are below the water line. This oil and oiled sediment should be contained and collected as part of the treatment process. If it cannot be recovered, the technique only disperses soil rather than cleans the shoreline.

Flooding is effective on most shoreline types, but it may have limited application only on sand or mud flats and on steep man-made solid structures. Generally, flooding is not a very intrusive technique.

Low-pressure, cold-water flushing is effective on most impermeable shoreline types and on some permeable shores or marshes. It may have limited application only on sand beaches, sand-gravel beaches, or sand flats, and is probably not appropriate on mud flats. Generally, this is not an intrusive technique and leaves most organ-isms in place.

Low-pressure, warm/hot water flushing is effective on most impermeable shoreline types, but may have limited application only on sand beaches, sand-gravel beaches, and sand flats and is probably not appropriate on mudflats. Generally, this is not a highly intrusive technique if used carefully in conjunction with high-volume flooding, which minimizes the potential adverse effects on shoreline organisms of using heated water.

The effectiveness of flooding and low-pressure flushing decreases as oil viscosity increases and as depth of penetration increases on cobble beaches.

High-pressure, cold-water flushing has limited application only for oiled bedrock or solid man-made shorelines. High-pressure water can dislodge attached organisms and may damage others.

High-pressure, warm/hot-water flushing usually has only limited application for solid man-made structures. The heated water or the pressures may dislodge attached organisms or damage others.

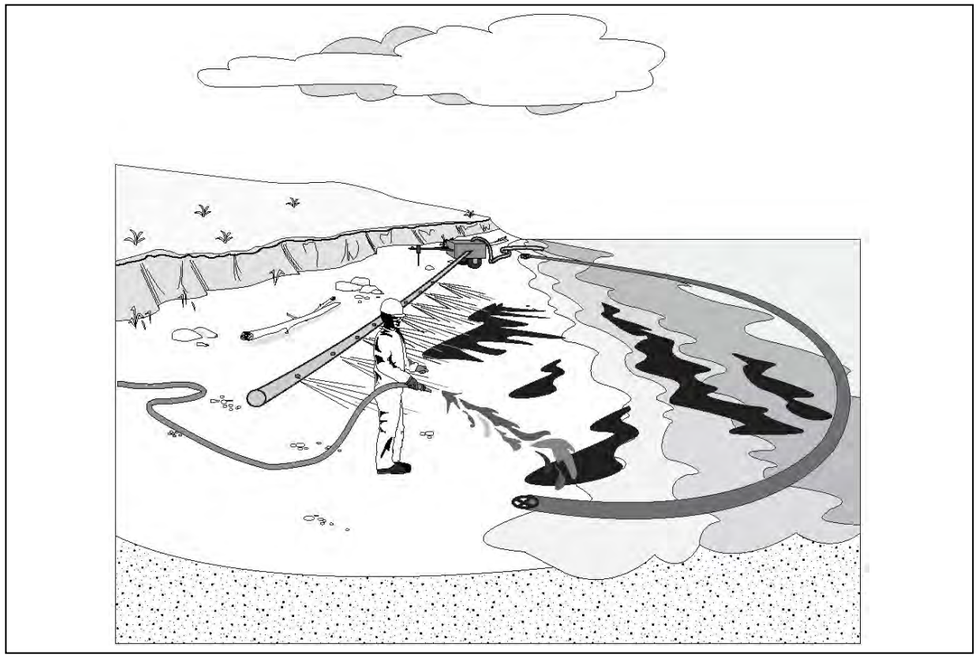


FIGURE 4-38 SHORELINE CLEANUP USING FLOODING AND FLUSHING

4.7.2 Shoreline Cleanup Using Manual Removal and Vacuum Methods

This group of physical methods involves removal of the oil or oiled materials (sediments, debris, vegetation etc.) from the shore zone to a location where it can be disposed of.

4.7.2.1 Manual Removal

The technique involves picking up oil, oiled sediments, or oily debris using gloved hands, rakes, pitchforks with screens, trowels, shovels, sorbent materials, buckets, etc. It may include scraping or wiping with sorbent materials or sieving if the oil has come ashore as tarballs. Collected material can be placed directly in plastic bags, drums, etc., for transfer. If the containers are to be carried to a temporary storage area they should not weigh more than can be easily and safely carried by one person. This tactic can be used practically and effectively in any location or on any shoreline type or oil type where access to the shore zone is possible and safe.

4.7.2.2 Vacuum

Truck-mounted vacuum systems may be used; the suction end usually is deployed manually to collect oil and/or oily water. These vacuum systems are primarily used where oil is pooled in natural depressions or hollows, or has been herded into collection areas. Vacuums can be used in combination with flooding or deluge techniques to float and collect oil. Vacuum trucks can be used to remove oil that is collected in sumps. A dual-head wash-vacuum system can be used in locations that are hard to access, such as between boulders and logs.

4.7.2.3 Deployment Considerations And Limitations

Unified Command approval is required for any shoreline cleanup tactic.

Manual removal is most applicable for:

- Small amounts of viscous oil (e.g., asphalt pavement removal),
- Surface or near-surface oil, and
- Areas inaccessible to vehicles.

Manual removal is labor intensive and slow for large oiled areas; although slower than mechanical removal, it generates less waste and the waste materials can be segregated easily at the source.

Foot traffic should avoid the oiled zone to prevent carrying oil from there into previously clean locations. Foot traffic can have an adverse impact on marshes or in tidal flat areas. Excessive foot traffic can impact vegetated areas, such as backshore tundra, or can disturb adjacent resources, such as nesting birds.

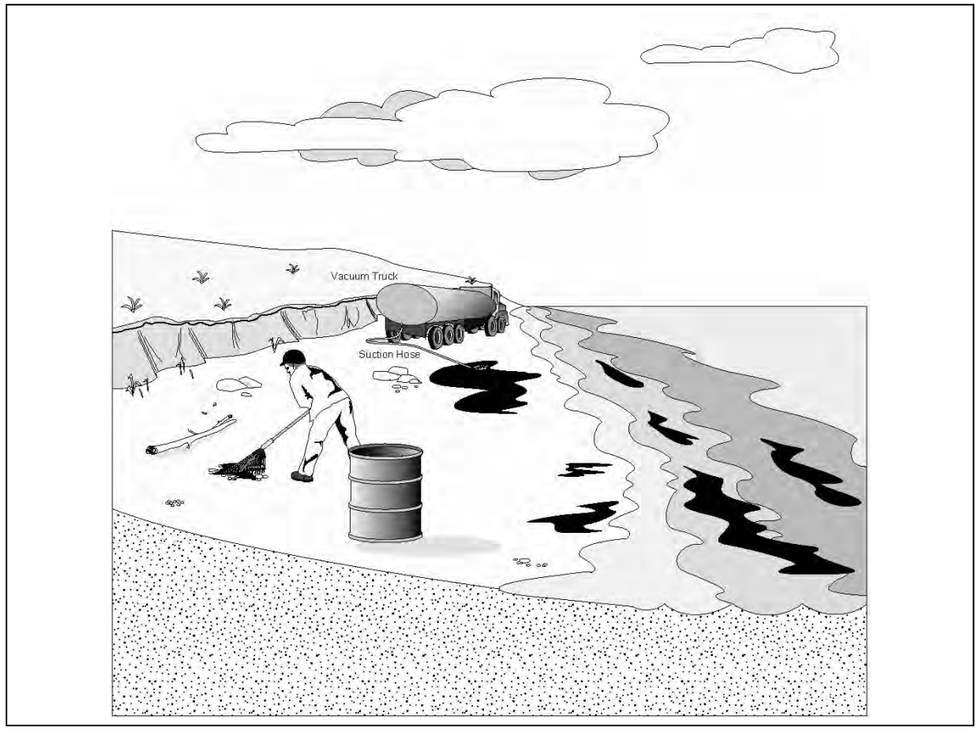


FIGURE 4-39 SHORELINE CLEANUP USING MANUAL REMOVAL AND VACUUM METHODS

4.7.3 Biological / Chemical Shoreline Response Tactics

This technique involves chemical agents or nutrients that alter the character of the stranded oil either to facilitate removal of the oil from the shore zone or to accelerate in-situ weathering. Nutrient enrichment and bioremediation can use products that have been developed for other applications. The other techniques in this group involve agents or materials that are designed specifically for oil spill response and that are available commercially from manufacturers and/or suppliers. Only bioremediation is a stand-alone technique; the remaining methods require an additional removal component.

4.7.3.1 Shoreline Cleaners

Shoreline cleaning (or surface washing) agents contain a surfactant that alters the surface tension of the oil, by a mechanism often referred to as detergency, so that the oil does not stick to substrate materials. The oil is lifted by rising tidal water levels and can be transported away from the shore. Cleaners may also be used to preterit shorelines to prevent oil from becoming stranded.

Cleaning agents can be applied directly to an oiled area with a hand spray or hose system. It may be used directly or as a presoak that is left for some time prior to flooding or flushing. The soak time varies depending on temperature and on the character of the oil. The preferred application is to use the agent on a rising tide so that the oil is immediately lifted from the shore, particularly on coarse-sediment beaches, as this minimizes the amount of oil that can be carried into the subsurface.

4.7.3.2 Solidifiers and Visco-Elastic Agents

Visco-elastic agents increase the viscosity of oil to enhance recovery and collection. Solidifiers alter the oil from a liquid to a solid in order to make recovery easier or to prevent remobilization or spreading of the oil. Agents may be available in a powder form that can either be applied directly or mixed with water prior to application. The agent is spread over and mixed with the oil. These agents are used in conjunction with removal techniques.

4.7.3.3 Nutrient Enrichment / Bioremediation

Naturally-occurring microorganisms (bacteria) use oxygen to convert hydrocarbons into water and carbon dioxide. This process usually occurs at the water interface and is limited by oxygen and nutrient availability and by the exposed surface area of the oil. If these three factors can be increased, then the rate of biodegradation can be accelerated.

Fertilizers can be obtained in solid or liquid form. Solid fertilizers can be broadcast using seed spreaders. On contact with water, the fertilizer slowly dissolves and releases water-soluble nutrients over time. Liquid fertilizers can be sprayed onto a shoreline using a number of commercially available types of equipment, such as paint sprayers.

4.7.3.4 Deployment Considerations and Limitations

Unified Command approval is required for any shoreline cleanup tactic.

The use of chemicals to control oil discharges or treat oiled shorelines is controlled by state and federal regulations; appropriate approvals and permits are required.

Shoreline cleaners can be used on fresh or salt water, and the technique is applicable for all types of oil. Shore-line cleaners are usually used in conjunction with collection techniques, such as sorbents and skimmers, to contain and recover the oil as is it released.

The effectiveness of shoreline cleaners is a function of oil type, and decreases as the specific gravity of the oil increases. The success of the method is dependent, to a degree, on the ability to contain and collect the oil that is released.

Solidifiers and visco-elastic agents can be used in either fresh or salt water conditions. These agents are not applicable where large pore spaces (cobble or boulders) might result in loss of the oil in the subsurface sediments or where there is oiled vegetation, as it may incorporate or smother healthy plants and animals. The dose in-creases as the viscosity of the oil decreases so that for some agents, approximately 10 to 20 times more agent is required to alter the viscosity of a light fuel oil than for a heavy fuel oil.

Bioremediation can be used on all shoreline types without affecting plants or animals. Bioremediation is best for use on residual oil after other techniques have been used to remove mobile or bulk oil from the shoreline. Applications may be repeated periodically to continue the supply of nutrients. Bioremediation may require tillers for mixing treatment agents with contaminated material.

Fertilizers may be used alone on a shore to degrade residual surface and/or subsurface oil, but the process is more effective if combined with tilling or other methods of breaking the oil into smaller particles, thereby significantly increasing the surface area for the microorganisms to affect.

Nutrient enrichment/bioremediation is relatively slow compared to other response options. Since the rate of bio-degradation decreases with lower temperatures, nutrient enrichment is more effective during warmer summer months.

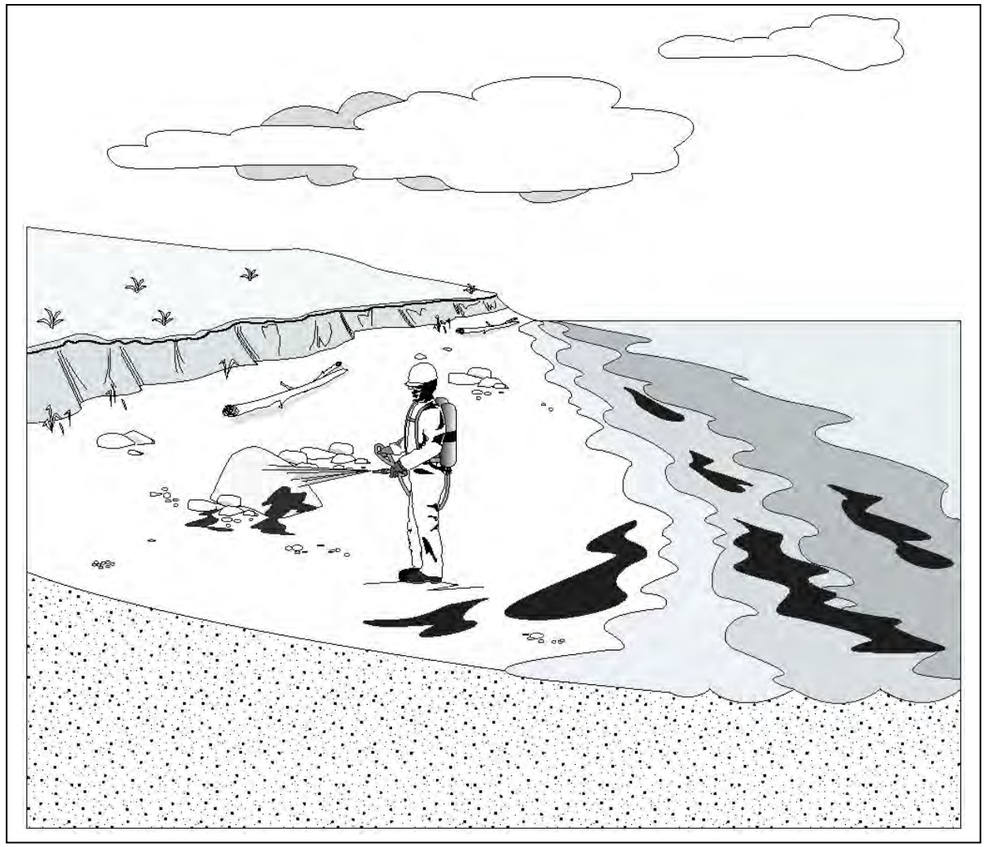


FIGURE 4-40 BIOLOGICAL / CHEMICAL SHORELINE RESPONSE TACTICS

Section 5. Containment Site Deployment Tactics

This section contains deployment diagrams and resource data sheets for all of Alyeska's preplanned oil spill containment sites designed to intercept the flow of oil in case of a spill from the pipeline. These sites are typically at streams or at drainage structures and are an essential component of the control actions in this C-Plan.

Following this introduction, the deployment diagrams and resource data sheets are presented for the preplanned containment sites. These sites and access to them are located with approval from the land management agencies.

It should be emphasized that the preplanned oil spill containment sites are areas of opportunity that can enhance containment efforts in that area. Every spill poses slightly different situations depending on many conditions such as water levels, braided stream conditions, etc. The presence of a preplanned containment site does not necessarily mean that containment efforts will take place at that exact site. Equipment might be better deployed up or downstream depending on the exact conditions at that time.

5.1 CRITERIA FOR SELECTING CONTAINMENT SITES

While most of the preplanned containment sites are on drainages, sites can be built on suitable terrain away from drainages. This would be particularly useful in intercepting oil spills near the pipeline or between preplanned containment sites. For purposes of emergency field actions, criteria have been established for selecting additional oil spill containment sites. This section presents criteria for logical systematic and consistent containment site selection on and off watercourses.

The following criteria will be considered when selecting containment sites:

- River and stream characteristics
- Man-made structures
- Topography
- Access and sensitive areas
- Potential spill volume
- Time of response

5.1.1 River and Stream Characteristics

The selection of containment sites in rivers and streams must consider the streams' characteristics that exist throughout the year. Availability of access, presence of adequate topography for working conditions, storage areas for oil removed from the rivers, and environmental considerations are also factors to be considered.

Important stream characteristics to be considered are as follows:

- Velocity
- Discharge and flow characteristics
- Channel configuration (width, depth, pool-riffle ratio)
- Man-made structures (culverts, spur dikes, bridges, low-water crossings)
- Back-water areas
- Side channels
- Presence of ponds adjacent to stream
- Bank vegetation
- River ice and aufeis characteristics

The significance of each characteristic depends on the season. These seasons of hydrologic importance are:

- ***Summer:*** Open-water period which includes low flow and rain flood.
- ***Freezeup:*** Period from when ice first begins to form on the river to when the stream is completely ice covered.
- ***Winter:*** Period when, if flow is present, it will be beneath the ice cover.
- ***Breakup:*** After snowmelt begins and water begins to flow on or adjacent to the ice until after the river is flushed of its ice cover.

The following discussion will consider river and stream characteristics pertaining to each seasonal period.

5.1.1.1 Summer

Low-Flow Period

During this period, the water level will be below the vegetation along the bank. In the smaller rivers and streams, the flow pattern will probably be a series of pools and riffles. Normally, the pools will exist on the outside of a meander where the velocities will be slower. The slower the water velocity, the more effective the containment procedures are. Access and a working area along the river will probably be good. Gravel bars and dry, high-water channels will probably be present for staging containment operations and obtaining materials for berms and sandbags. Depressions in dry, high-water channels could be used for temporary storage of oil removed.

Preferred containment sites will probably be at the following locations:

- ***Man-Made Structures:*** Bridge, culverts, spur dikes, and low-water crossings provide ideal access points where dikes, berms, or diversions can be installed to slow water velocities and facilitate containment procedures.
- ***Natural Pools:*** At the outside of meanders or other pools where velocities are slower.
- ***Backwater Areas:*** Pools may exist behind log jams or debris jams.
- ***Gravel and Sand Bars:*** Berming and diking could be facilitated where sufficient gravel materials are available.

High-Flow Period

When rainstorms cause high-water levels, access and containment procedures are hampered. Velocities of the water will be faster (usually greater than two feet per second), and probably prohibitive to booming operations, except at specific locations. Increased turbulence will enhance oil/water emulsions. The water level will probably be up to the vegetation line and all high-water channels could contain flowing water, with pool and riffle sequences probably flooded over. Except for the small streams, fording across the river by men and equipment may be difficult or impossible.

Preferred containment sites will probably be at the following locations:

- ***Man-Made Structures.***
- Side Channels: High-water channels will probably be flowing water. Those that exist along the side of the river, especially where the oil entered, could be utilized for partial or complete containment. These channels are normally narrower and facilitate berming and diking more easily than the main channel.
- Backwater Areas: Pools with lower water velocities might exist behind log and debris jams, again facilitating containment procedures.
- Vegetated Banks: The water level will probably be up to the vegetation and will probably cause some oil to collect on the vegetation in small pools and eddies along the bank. Partial containment could be accomplished by utilizing these.

5.1.1.2 Freezeup

Before Ice Cover: Normally, the rivers and streams will be at low flow during the freezeup period. The previous discussion on summer low flow periods would apply with some modifications. Ice cover will first begin to form in pools with lower velocities. This ice cover could possibly support men and light equipment, but not heavy equipment. Open water will exist across the riffles and high velocity reaches. Freezing temperatures could cause ice buildup on containment equipment that is repeatedly put in and taken out of the water.

Preferred containment sites will probably be at the following locations:

- ***Man-Made Structures.***
- Natural Pools: Where the velocity is lowest, ice will first begin to form and accumulate on rivers. This is a visible indicator of possible containment sites.
- Freezeup Ice Jams: When ice begins to form on rivers, ice flows will often accumulate and jam up. Freezeup ice jams most often occur where there is a sudden decrease in velocity, where the stream width is constricted, and deep pools exist. These could possibly be utilized as natural containment sites.
- Gravel and Sand Bars: Berming and diking could be facilitated where sufficient gravel materials are available. However, because the ground may be frozen, heavy equipment would probably be required.

After Ice Cover

During freezeup, flow in a river often decreases quite rapidly. However, in rivers and some streams, flow may continue after the initial ice cover has formed. Water velocity under ice cover will be less than occurs with open water. Often the ice is not sufficiently thick to hold heavy equipment, but could hold people and light equipment. If the oil spill is on the ice surface, care should be taken to not break the ice cover, thereby allowing the oil to join the flowing water. If the spill enters the water beneath the ice, the cover will then have to be broken to facilitate containment and cleanup.

Preferred containment sites, if the oil enters the flowing water under a thin ice cover, would be as follows:

- ***Man-Made Structures:*** These would provide good access, especially for the heavy equipment that may be required to rip and remove the ice cover.
- ***Side Channels:*** If it is known or suspected that the oil is entering the main channel by way of a side channel, it could be plugged with a berm or dike, facilitating containment procedures.
- ***Backwater Areas:*** Water velocities beneath an ice cover are probably low enough to facilitate booming operations, especially at natural pool locations. If the pool locations are not known beforehand, ice auger holes could be made at suspected locations to determine depths and velocities, Once confirmed and the local ice cover is removed, containment operations could proceed.

5.1.1.3 Winter

In most cases, ice cover will be thick enough to (1) prevent oil from entering water beneath the ice, and (2) allow winter cleanup methods described in Section 4 to be used. Should oil enter beneath the ice or intragravel flows, it will be necessary to choose containment sites.

Flow Beneath the Ice

Only the larger rivers south of the Yukon River can be expected to flow continuously throughout the winter. North of the Yukon, the larger rivers flow intermittently or in locations where springs exist. Small rivers and streams may flow part of the winter or throughout the winter during some years. Should an oil spill enter the water beneath the ice, it is important to determine if the water is flowing beneath the ice cover when locating containment sites. This can be achieved by ice augering holes through the ice (usually two to seven feet thick) and verifying that water is flowing by using a current meter. Pockets of water can exist in the deeper holes throughout the winter without a continuous flow of water.

If oil is present in flowing water beneath the ice, the containment site selection would be similar to that discussed previously in the discussion of “After Ice Cover” under “Freezeup” with some modifications.

- The ice will probably be thick enough to support heavy equipment. However, the thicker ice will also be more difficult to remove. A trenching machine and a loader may be required to remove the ice. The ice chunks should be removed from the containment site area.
- ***Aufeis Areas in Streams:*** The presence of active aufeis indicates that flowing water is present upstream. Oil flowing beneath the river ice cover could possibly be forced to the surface at the upstream end of the aufeis field, providing a visible indicator of its presence. Containment sites should be located at the upstream end of the aufeis field. Trenching and removal of ice and riverbed material could provide a containment location and prevent the oil from being entrained in the ice downstream.

Flow at Open Leads

Open leads may be present on watercourses during a portion of, or throughout the winter. The primary cause of open leads is the presence of springs; occasionally, zones of high velocity such as rapids or

riffles prevent the formation of surface ice. If an oil spill occurs, open leads would be a potential site for both introducing oil under the surface of the ice, and for containment of oil flowing under the ice from an upstream entry point. The location and existence of open leads may vary in streams annually and should be checked each season for response planning.

If an oil spill occurs in the vicinity of or upstream from an area of open leads, containment site selection would be as follows:

- Divert surface flow of oil away from open leads. Snow berms could be utilized to prevent oil from reaching open water.
- The relatively thin ice immediately upstream or downstream of an open lead should be removed to increase containment and/or storage, and to allow the use of booms and other structures (berms) necessary to reduce water velocity when oil has entered the flowing water.

Intragravel Flow

Even if flowing water is not detected beneath the ice, intragravel flow may exist. The velocity would be very slow (less than ½ fps), but would provide a route for oil to flow in. If this situation exists, containment site selection would be as follows:

- ***Trenching the Stream Bed:*** The stream bed would have to be trenched deep enough to intercept the intragravel flow of oil and pond it. A location where heavy equipment could operate would be preferred.
- ***Man-Made Structures.***
- ***Aufeis Areas in Streams:*** As discussed previously, the upstream end of aufeis fields would be a good location for trenching out a containment site.

5.1.1.4 Breakup

Before Significant Ice Movement

During the initial stages of breakup, snowmelt will begin the flow of water in the streams and rivers. If flow persisted beneath the ice throughout the winter, the increased flow will raise the ice cover slowly without significant downstream movement of ice. If the ice was frozen fast to the riverbed, the water will flow over and adjacent to the ice cover. It must be recognized that sudden fluctuations in discharge and water elevation should be expected during this period.

Containment site selection will be based on field judgment; however, the following guidelines will assist:

- ***Man-Made Structures:*** The physical presence of bridges, culverts, spur dikes and low-water crossings (LWCs) will assist in diverting the stream flow and ponding the water.
- ***Backwater Areas:*** Ponding of water often occurs before the high runoff condition begins. Utilization of natural ponds, with additional construction of berms and dikes to extend the existence of these ponds, could provide a good containment site.
- ***Side Channels:*** Side channels could be converted to a good containment pond if the following procedures were utilized:
  - Berm or dike the downstream end of the side channel.
  - Blast or rip out a suitable channel for the flow of water in the main channel at the upstream end of the side channel.
  - Install a diversion skimmer in conjunction with an overflow berm at the side channel mouth such that the flowing oil is diverted into the side channel but allows the majority of water to flow down the main channel.
  - At the oil diversion location, a dike will also probably have to be constructed to insure that the water continues to flow down the main channel.

During and After Ice Movement

After the spring runoff has increased significantly, the water will begin to break up the ice. Because of the higher discharge, velocities, and presence of floating ice, containment procedures are hampered. The increased turbulence will enhance oil/water emulsions. The water level will probably be up to the vegetation line and all high-water channels may be flowing water. Except for small streams, fording across the river by men and equipment may be difficult to impassable. Every effort should be directed towards utilizing natural or man-made pools and diversion locations, because the construction of berms and dikes will probably be severely limited. Emphasis should be placed on preventing the oil from entering a larger stream where containment difficulties will increase.

Possible containment sites could be at the following locations:

- ***Man-Made Structures.***
- Backwater Areas: Often temporary ponding of water will exist behind log, debris and ice jams. Utilization of these locations is advised, but with caution. Typically, these jams are temporary and may release at unpredictable times, putting men in a dangerous predicament. However, utilization of these locations could provide partial containment.
- Side Channels: All channels will probably be flowing water, but the small side channels may have flow characteristics that would allow containment procedures. Particularly if the oil is entering by way of the side channel, effort should be put towards keeping the oil from entering the main channel.
- Vegetated Banks: The vegetation along river banks and the small eddies and pools probably will retain some of the oil. Partial containment could be accomplished by utilizing these.

5.1.2 Man-Made Structures

Man-made barriers could provide excellent containment structures, particularly when there is a chance to contain the spill at the leak or along the pipeline. The workpad, roads and highways, culverts, bridges, spur dikes, low water crossings, old survey trails, firebreaks, seismic trails, material sites, and various cleared areas or open fields can be used to construct containment sites, using techniques discussed in Section 4. Availability of such structures near an oil spill can be determined by consulting the aerial photographs.

5.1.3 Topography

Knowledge of local topography aids containment site selection in several ways. Careful topographic map interpretation can indicate natural terrain features, such as depressions or old morainal ridges, that would lend themselves to constructing containment sites. Topography must be considered when estimating the

storage capacity of a potential site, planning access routes for operations (containment, cleanup, disposal) and assessing the speed at which oil could reach a containment site.

5.1.4 Access and Sensitive Areas

This factor is probably the most critical in determining the potential of a containment site. Restrictions on modes of access, ground transportation routes, and those arising from the presence of sensitive cultural, biological (vegetation and nesting/spawning areas), soil, and topographical areas all limit the choice of sites. Section 1.6 in Volume 1 discusses these problems in detail, and should be referred to when selecting containment sites.

5.1.5 Potential Spill Volume

This information is necessary in selecting sites that can cope with a large spill volume with regard to the feasibility of containment, cleanup, and disposal. Segment instructions provide spill volume for that segment, which can be used with local topographical and river/stream characteristics to evaluate suitability.

5.1.6 Time of Response

Time of response is an important consideration in the selecting containment sites. Factors to consider are the size of spill, time necessary for oil to reach a watercourse, and flow velocity. A major premise in the selection of existing containment sites was that some sites should be picked even though the time required to reach the site would not always allow interception of the leading edge of the oil. Containment of oil with a well-placed site is more critical than trying to intercept the leading edge in all instances. However, when weather or transportation problems delay response time or in the event of a spill directly into flowing water, alternate sites may be required. Using the criteria presented here, teams should designate potential sites available for field use in the contingency areas assigned to them.

5.2 TRAVEL TIME ASSUMPTIONS

This section contains containment site information concerning location, travel times (by ground and by air), and tactics maps for each containment site along TAPS. The travel time parameters were calculated with the following assumptions:

- **Nearest Response Base (miles):** Direct line distance (in statute miles) from the containment site to the nearest response base.
- **Nearest Response Base (flying time):** Travel time from the response base to the containment site assuming a helicopter speed of 100 mph.
- **Nearest Response Base (ground time):** Travel time from the response base to the containment site assuming the following rates of travel: 40 mph highway, 10 mph workpad, 2 mph off-road, 10 mph creeks, and 20 mph rivers.
- **Distance to Nearest Helicopter Refueling Point:** The flying distance and time to the nearest refueling site is based on a helicopter speed of 100 mph with an additional three minutes allowed for take-off and landing. During a response action, supplemental fuel may also be made available using portable equipment.
- **Travel Time by Ground to Staging Area:** Travel time from the nearest response base to the staging area (if applicable) assuming the following rates of travel: 40 mph highway, 10 mph workpad, 2 mph off-road, 10 mph creeks, and 20 mph rivers.

TABLE 5-1 LIST OF CONTAINMENT SITES

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
1-0	Putuligayuk River	West dock crossing of Put River	(b) (7)(F), (b) (3)	1	–
1-1	Putuligayuk River	Spine Road crossing of Put River		1	–
1-1A	Sag River	Sag River below Endicott Bridge		1	–
1-1B	Sag River	Sag River near the fire training grounds		1	–
1-2	Grayling Gulch	Spine Road crossing of Grayling Gulch		2	–
1-3	Putuligayuk River	Kuparuk Pipeline access road crossing of Put River		1	1
1-4	Sag River	Small lake outlet to Sag River		3	10,11
1-5	Sag River	Side channel of Sag River		4	14
2-0	Sag River	LWC at 125 APL-4		9	38
2-1	Dan Creek	Dalton Hwy where Dan Creek meets Sag River		10	44
2-2	Lori Creek	Dalton Hwy Crossing of Lori Creek		10	44
2-2A	Lori Creek	Dalton Hwy Crossing of Lori Creek		10	45
2-3	Unnamed Creek	0.6 Miles to the Left of Dalton Hwy		10, 11	46
2-4A	Unnamed Creek	Dalton Hwy Crossing of Unnamed Creek		11	47
2-5	Sag River	On 121 APL-1 at Sag River channel		12	51
2-6	Sag River	Approx. 1/8 mile to right of Dalton Hwy		12	51
2-6A	Rudy Creek	Rudy Creek Crossing of Dalton Hwy		12	51
2-7	Sag River	Sag River near 120 AMS-20		12	51
2-8	Oks Creek	Pipeline crossing of Oks Creek		12	52
3-2	Unnamed Drainage	Approx. 1/8 mile to left of Dalton Hwy		13	57
3-3	Unnamed Drainage	Unnamed Drainage crossing of Dalton Hwy		12, 13	55
3-3A	Oks Creek	Oks Creek near the Dalton Hwy		13	57, 58
3-4	Oks Creek	Oks Creek crossing of work pad		13	60
3-5	Toolik River Tributary	Where two tributaries of Toolik River meet		13	–
3-6	Toolik River	Toolik River		11	–
3-7	Toolik River Tributaries	Confluence of two Tool k River tributaries		13	–
3-8	Toolik River	Toolik River		13	–
3-9	Oks Creek	Oks Creek crossing of Dalton Hwy	(b) (7)(F), (b) (3)	13	60
3-11	East Fork Kuparuk River	East Fork Kuparuk River		13, 13W	64
3-12	Kuparuk River	Kuparuk River crossing of the old Winter road		13W	–
3-13	Kuparuk River	Kuparuk River		12W	–
3-14	Kuparuk River	Kuparuk River near the Dalton Hwy		13W, 14	65
3-15	Becky Creek	Becky Creek crossing of 116 APL-6 road		13W, 14	65
3-15A	Kuparuk River	Kuparuk River crossing of Dalton Hwy		13W, 14	65
3-16	Becky Creek	Pipeline crossing of Becky Creek		14	66
3-17	South Inlet Toolik Lake	South Inlet of Toolik Lake		14	–
3-18	Toolik Lake	Entrance of Tool k River to Toolik Lake		14	–
3-19	Kuparuk River Tributary	Outlet of Toolik Lake		14	–
3-20	Jill Creek	Jill Creek		14	–
3-21	Lake Outlet, Jill Creek	Lake outlet of Jill Creek		14	–
3-22	Galbraith Lake Slough	Ga braith Lake Slough		15	72
3-23	Atigun River	Atigun River		14E, 15E	–
3-24	Galbraith Lake Inlet	Between Galbraith Airport and the pipeline		15	71
3-25	Island Lake Outlet	Outlet of Island Lake		15	70
3-26	Galbraith Tr butary	Tributary crossing of Galbraith Airport Road		15	–
3-27	Dillon's Run	Dillon's Run above Galbraith Lake		15	71
3-28	Unnamed Creek	Small drainage into Galbraith Lake		15	72
3-29	Atigun River	Atigun River near Dalton Hwy bridge		15	73
3-30	Dwyer's Diddy Creek	Dwyer's Diddy Creek crossing of Dalton Hwy		15	73
3-31	Unnamed Creek	Small drainage into Atigun River from a pond		15	74
3-32	Atigun River	Atigun River near the work pad at PLMP 149		16	76
3-33	Atigun River	Atigun River		17	81
3-34	Atigun River	Where Atigun River & Stems Creek meet at Dalton Hwy		17	83

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
4-0	West Fork Chandalar River	Chandalar River Crossing of Dalton Hwy	(b) (7)(F), (b) (3)	18	84,85
4-1	West Fork North Fork Chandalar River	W. Fork of the N. Fork of the Chandalar River		18	–
4-1A	West Fork North Fork Chandalar River	River crossing of the pipeline near MP 173		18	87
4-2	North Fork Chandalar River	Near N end of Chandalar Lake		22E	–
4-3	Middle Fork Koyukuk River	Downstream from the pipeline crossing		21	102
4-4	Dietrich River	Dietrich River near 108-APL-1A		18	90, 91
4-5	Dietrich River	Dietrich River near PLMP 184		19	93
4-7	Dietrich River	Dietrich River near the pipeline		19	95
4-9	Snowden Creek	Snowden Creek crossing of the pipeline		20	99
4-10	Dietrich River	Dietrich River near Dietrich Camp		21	100
4-11	Brockman Creek	Brockman Creek confluence with Dietrich River		21	101
4-11A	Middle Fork Koyukuk River	Pipeline and highway crossing of Koyukuk River		23	110, 111
4-11B	Middle Fork Koyukuk River	Middle Fork Koyukuk River		24	119
4-14	Trent's Trickle	Culvert site a(b) (7)(F),		25	122
4-15	Middle Fork Koyukuk River	Middle Fork Koyukuk River		25	–
4-16	Chapman Creek	Middle Fork Koyukuk River		25	–
4-16A	Middle Fork Koyukuk River	Middle Fork Koyukuk River		25	–
4-17	South Fork Koyukuk River	South Fork Koyukuk River 9 miles downstream of pipeline		26W	–
4-18	Unnamed Creek	S. Fork Koyukuk River – 1 mile from PLMP 256		26	126
4-20	South Fork Koyukuk River	Confluence of Unnamed Creek and South Fork Koyukuk River 2 miles downstream of pipeline		26	126
4-21	South Fork Koyukuk River	On the south side of South Fork Koyukuk River		26	126
4-23	S. Abba Dabba Creek	South Fork Koyukuk River confluence of Abba Dabba Creek		26	126
4-24	Abba Dabba Creek	Culvert crossing of Abba Dabba Creek under workpad		26	127
4-25	Prospect Creek	Confluence of Jim River and Prospect Creek		27	–
4-26	Jim River	At Jim River approx. 2 miles from Prospect Camp		27	–
4-27	Grayling Creek	Grayling Creek is the south exit point of Grayling Lake		26	128, 129

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
4-28	Drainage to Grayling Lake	(b) (7)(F)	(b) (7)(F), (b) (3)	26	128, 129
4-29	Grayling Creek			26	130
4-30	Jim River			27	132
4-31	Paradise Slough			27	134
4-32	Jim River			27	–
4-33	Jim River			27	136
5-1	Swampy Drainage to Jim River			27	136
5-2	Unnamed Drainage			27	136
5-3	Prospect Creek			27	137
5-4	Bonanza Creek			28W	
5-6	Fish Creek			29	
5-7	Pung's Crossing Creek			28	141
5-8	Alder Mountain Creek			29	
5-9	Kanuti River			30	149
5-10	Unnamed Creek			30	149
5-12	Netsch's Creek			30	149
5-13	West Fork Dall River			31,31E	–
5-14	West Fork Dall River			31E	–
5-15	Ray River			34	–
5-16	North Fork Ray River			33	–

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
5-17	North Fork Ray River	Dalton Hwy crossing of the North Fork Ray River	(b) (7)(F), (b) (3)	32	163, 164
5-18	Fort Hamlin Hills Creek	(b) (7)(F), (b) (3)		33	166, 167
5-19	North Fork Ray River	Site is west of Dalton Hwy just north of confluence with Ray River. Site is 4.0 river miles to Ray River		33	–
5-20	Fort Hamlin Hills Creek	Site is at confluence of Ray River and Fort Hamlin Hills Creek		33	–
5-22	Unnamed Creek #6	Site is on the Ray River downstream from Unnamed Creek #6		34	–
5-24	Unnamed Creek #9	Site is at the confluence of Unnamed Creek #9 and Ray River		34	–
5-25	Woodchopper Creek	Culvert site is at the junction of Woodchopper Creek and Dalton Hwy		34	175
5-26	Burbot Creek	Culvert site is at junction of Burbot Creek and Dalton Hwy		34	175, 176
5-29	Unnamed Drainage	Site is at confluence of Unnamed Drainage and Yukon River		34	–
6-2	Isom Creek	Confluence of Isom Creek and Yukon River		35W	–
6-4	Unnamed Creek	Confluence of Unnamed Creek and Isom Creek		35	181
6-6	Hess Creek	Hess Creek		35	–
6-11A	Hess Creek	Confluence of Hess Creek and Unnamed Creek		36	–
6-11B	Hess Creek	Pipeline crossing of Hess Creek		36	191
6-11C	Hess Creek	Hess Creek		35WA	–
6-11D	Hess Creek	Hess Creek		36	–
6-12	Unnamed Creek	Just above confluence of Unnamed Creek and Hess Creek		35,36	–
6-13	Unnamed Creek	Hess Creek below 6-11A		36	–
6-15	Mastadon Creek	Confluence of Mastadon Creek and Hess Creek		36	190, 191
6-16	Fish Creek	Confluence of Fish Creek and Hess Creek		36	190, 191
6-19	Hess Creek	Just down Hess Creek from Erickson Creek		36	192
6-23	Erickson Creek #2	Pipeline crossing of Erickson Creek		36	193
6-24	Erickson Creek #1	Pipeline crossing of Erickson Creek		36	194, 195
6-25	Erickson Creek	LWC of right-of-way		36E	196

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
6-26	West Fork Tolovana River	Manley Springs Road crossing of West Fork Tolovana River	(b) (7)(F), (b) (3)	37	–
6-26A	West Fork Tolovana River	End of access road off Manley Hot Springs Road		37	201
6-27	Lost Creek	Lost Creek above West Fork Tolovana River		37	–
6-29	Lost Creek	Dalton Hwy crossing of Lost Creek		37	–
6-30	Lost Creek	Pipeline crossing of Lost Creek		37	199
6-31A	Tolovana River	Tolovana River		38	–
6-34	Wilber Creek	Pipeline crossing of Wilber Creek		38	207
6-35	Tatalina River	Tatalina River		39	–
6-37	Slate Creek	Slate Creek below the pipeline		38	–
6-38	Slate Creek	Slate Creek above the pipeline		38	208
7-3	Globe Creek	Globe Creek crossing of Elliot Hwy		39	–
7-4	Globe Creek	Globe Creek is downstream of the pipeline		39	–
7-5	Little Globe Creek	Pipeline crossing of Little Globe Creek		39	215
7-6	Tributary Creek	Pipeline crossing of Tributary Creek		39	215
7-7	Aggie Creek	Aggie Creek above Washington Creek		40W	–
7-8	Aggie Creek	Confluence of North Branch and main branches of Aggie Creek		39	216
7-9	Enigma Creek	Enigma Creek confluence with Aggie Creek		39	216
7-10	Branch Creek	Branch Creek confluence with Aggie Creek		39	–
7-11	Snowshoe Creek	64-APL-2 crossing of Snowshoe Creek		40	–
7-12	Carver Creek	Carver Creek upstream of Washington Creek		40	–
7-13	Washington Creek	Pipeline crossing of Washington Creek		40	221
7-14A	Chatanika River	Chatan ka River approx. 13.7 air miles from pipeline		40W, 41WA	–
7-14B	Chatanika River	Chatan ka River at Bennett Road		41WB	–
7-16	Unnamed Creek	Unnamed Creek confluence with Chatan ka River		40	–
7-17	Unnamed Drainage	Outlet of Pond Lake into Pond Creek		40	224
7-18	Shocker Creek	Shocker Creek, approximately 2 miles from the pipeline		40	–

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
7-20	Sargent Creek	Confluence on Sargent Creek and Chatanika River	(b) (7)(F), (b) (3)	40	–
7-21	Vault Creek	63-APL/AMS-2 crossing of Vault Creek		40	–
7-22	Vault Creek	Access road crossing of Vault Creek		40	227
7-23	Treasure Creek	Pipeline crossing of Treasure Creek		40	227
7-25	Goldstream Creek	Ballaine Road crossing of Goldstream Creek		41	–
7-27	Goldstream Creek	Goldstream Creek at the gravel pits		41, 41W	–
7-27A	Goldstream Creek	Goldstream Road crossing of Goldstream Creek		41	230
7-31	Engineer Creek	Engineer Creek crossing of the pipeline		41	231
7-32	Chena River	Tank Road crossing of Chena River		42, 42W	–
7-33	Chena River	Chena River near the municipal snow dump		42W	–
7-33A	Chena River	Chena River		42W	–
7-34	Chena River	Chena River		42W	–
7-36	Moose Creek	Moose Creek crossing of the pipeline		43	243
7-37	Piledriver Slough	Confluence of Piledriver Slough and Tanana River		43, 43W	–
7-38	Moose Creek	Pipeline crossing of Moose Creek		43	244
7-39	Moose Creek	Transmitter Road crossing of Moose Creek		43	245
7-40	French Creek	Pipeline crossing of French Creek		43	245
7-41	French Creek	Manchu Road crossing of French Creek		43	246
7-42	French Creek	Quarry Road crossing of French Creek		43	248
8-1	Little Salcha River	Richardson Hwy crossing of Little Salcha River		44	–
8-2	Unnamed Creek	Near confluence of Unnamed Creek and Salcha River		44	–
8-3	Little Salcha River	Little Salcha River		44	254
8-4	Gnat Creek	Gnat Creek confluence with Salcha River		44	255
8-5	Salcha River	Salcha River Campground		44, 45W	–
8-6	Skinny Creek	Confluence of Skinny Creek and Salcha River		44	257, 258
8-6A	Salcha River	Pipeline crossing of the Salcha River		44	257, 258

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
8-7	Redmond Creek	Redmond Creek	(b) (7)(F), (b) (3)	44, 44E	–
8-7A	McCoy Creek	Confluence of McCoy Creek and Salcha River		44E	–
8-8	Minton Creek	Pipeline crossing of Minton Creek		45	266
8-9	McCoy Creek	McCoy Creek		45	–
8-12	Shaw Creek	Richardson Hwy crossing of Shaw Creek		46	–
8-13	Rosa Creek	Rosa Creek		45	269
8-14	Delta River	Delta Concrete Plant		47, 48	283
8-15	Tanana River	Tanana River side channel		47	278, 279
8-16	Tanana River	Tanana River		47	277, 278
8-18	Jarvis Creek	Richardson Hwy crossing of Jarvis Creek		48	285
10-1	Delta River	Delta River		53	306
10-2	Phelan Creek	Phelan Creek		53	307
10-3	Bushy Creek	Bushy Creek near confluence w/ Phelan Creek		53	308
10-4	Good Buddy Creek	Confluence of Good Buddy Creek with Phelan Creek		53	310
10-5	Wonder Creek	On dry creek above Phelan Creek		54	310
10-6	Paxson Lake	Outlet of Paxson Lake		57, 57W	–
10-7	Gulkana River	Entrance of Gu kana River to Paxson Lake		56	–
10-7A	Gulkana River	Gu kana River		55	–
10-8	Fish Creek	Entrance of Fish Creek into Summit Lake		55	317
10-9	Gunn Creek	Just upstream of confluence with Summit Lake		54	315
10-9A	Gunn Creek	Just upstream of the confluence with Summit Lake		54	314, 315
10-10	Spring Creek	Spring Creek		57	327
10-11	Meiers Lake	Island near entrance to the lake		57	326
10-12	Haggard Creek	Pipeline crossing of Haggard Creek		58	–
10-16	Gulkana River	Richardson Hwy crossing of Gu kana River		61	–
10-17	Gulkana River	26-APL-2 crossing of Gulkana River		59	336
10-18	Dry Creek	Richardson Hwy crossing of Dry Creek		62	346
10-19	Dry Creek	22-APL-1 crossing of Dry Creek		62	347
10-20	Tazlina River	Tazlina River downstream from camp ground		63	352

SITE	NAME	LOCATION	GPS COORDINATES	C-PLAN MAP	AERIAL
10-21	Moose Creek	Confluence of Moose Creek and Tazlina River	(b) (7)(F), (b) (3)	62	349, 350
11-1	Yetna Creek	Richardson Hwy crossing of Yetna Creek		63	354
11-2	Klutina River	Confluence of Klutina and Copper Rivers		63	–
11-2A	Willow Lake	Richardson Hwy above Willow Lake		64	363
11-3	Willow Creek	Edgerton Hwy crossing of Willow Creek		64E	–
11-4	Tonsina River	Edgerton Hwy crossing of Tonsina River		64EA	–
11-5	Squirrel Creek	Richardson Hwy crossing of Squirrel Creek		65	–
11-6	Little Tonsina River	14-APL-4 crossing of Little Tonsina River		66	369
11-7	Little Tonsina River	Little Tonsina River just north of PS-12		67	374, 375
12-1	Tiekel River	Tiekel River near 10-APL-3		68	384
12-2	Tiekel River	Tiekel River near the Billy Mitchell Campground		68	386
12-3	Tsina River	Tsina River near Stuart Creek		68, 69	385
12-3A	Tsina River	8-APL-2 crossing of the Tsina River		68	390
12-3C	Tiekel River	Tiekel River		68, 69	387
12-4	Ptarmigan Creek	7-APL-1A access road crossing of Ptarmigan Creek		70	395
12-5	Ptarmigan Creek	Richardson Hwy crossing of Ptarmigan Creek		71	398
12-6	Abercrombie Creek	Confluence of Abercrombie Creek and Lowe River		72	410
12-7	Lowe River	Pipeline crossing of Lowe River		70	401, 402
12-8	Brown's Creek	Confluence of Brown's Creek and the Lowe River		71	404

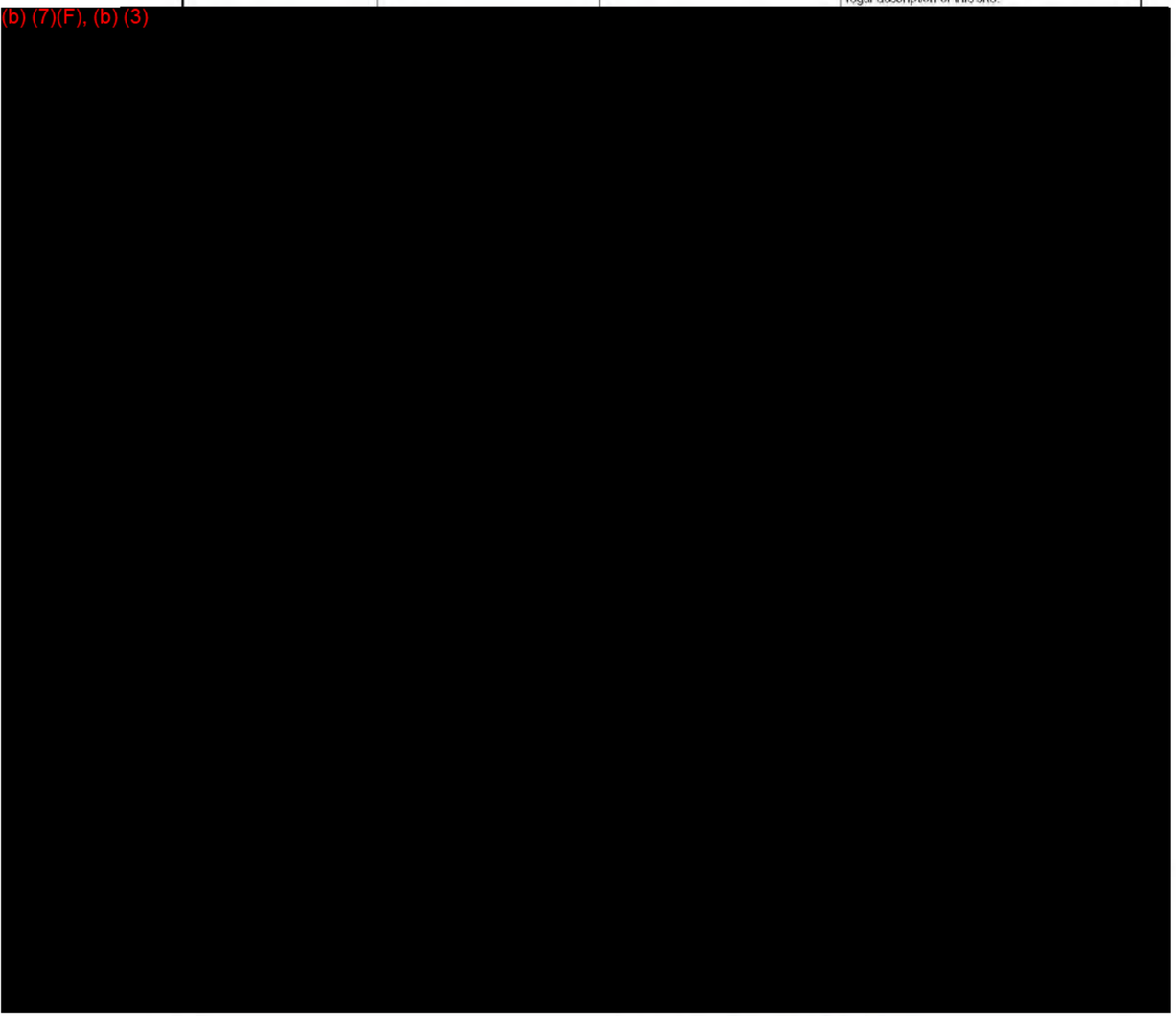
Alyeska pipeline SERVICE COMPANY

Putuligayuk River — CS 1-0

River Data	Staging Areas	Base Map Containment Sites	CS 1-0 Putuligayuk River
• Width = 200 ft. - 400 ft. • Velocity = 1 - 3 ft./sec.	• PS 1 • West Dock • ACS Base	CS 1-0 CS 1-1 CS 1-1A CS 1-1B CS 1-2 CS 1-3	C-Plan Map Ref: 1 Alyeska Aerial Ref: N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
West dock crossing of Put River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive	Helicopter/boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming	Ice slotting Deflection and containment booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 1-1 CS 1-3	None

III. General Site Information

Water Path:	Water Variations:
Put River flows past PS01 and into Prudhoe Bay several miles downstream of the site.	The Put River ranges from very low, with minimal flow, to full and moderate current. It is susceptible to rain and seasonal influences.
LZ Location: At the site	**Forward Staging Area:** West Dock and associated road area

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None; boom is pre-deployed in the summer months.

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra and open areas
Location of Nearest Initial Helicopter Refueling Point: Deadhorse Airport	**Utilize Additional Response Resources from:** ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

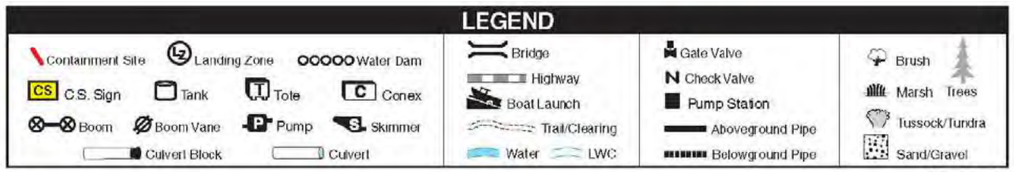
IV. General Site Description

The river is accessible from multiple areas at the site. Braided channels and other areas of opportunity are available along the river bank.

River Data	Staging Areas	Base Map Containment Sites	CS 1-1 Putuligayuk River
• Width = 200 ft. - 400 ft. • Velocity = 1 - 3 ft./sec.	• PS 1 • Pipeline Work Pad • ACS Base	CS 1-0 CS 1-1 CS 1-1A CS 1-1B CS 1-2 CS 1-3	C-Plan Map Ref. 1 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] legal description of this site North

(b) (7)(F), (b) (3)

[redacted]



Not to Scale

Alyeska pipeline

Putuligayuk River

CS 1-1

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Spine Road crossing of the Put River	N/A	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Drive	Helicopter/boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming in areas of opportunity near site	Containment booming in open areas Water dam or snow berming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 1-3	CS 1-0

III. General Site Information

Water Path:	Water Variations:
The Put River flows past PS01 near the site and enters Prudhoe Bay.	The Put River ranges from very low, with minimal flow, to full and moderate current. It is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At the site	On access roads nearby for field pipeline support

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None; boom is pre-deployed in the summer months.

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra and open areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Deadhorse Airport	ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

IV. General Site Description

The site is at the Spine Road crossing of the Put River and flows through several culverts.

There are numerous roads and other access points to the river near this area.

River Data	Staging Areas	Base Map Containment Sites			CS 1-1A Sag River
• Width = 100 - 350 ft. Vairiable/Braided • Velocity = 2 - 4 ft./sec.	• PS 1 • ACS Base • Fire Training Grounds	CS 1-0 CS 1-1B	CS 1-1 CS 1-2	**CS 1-1A** CS 1-3	C-Plan Map Ref. 1 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert	Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC	Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe	Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline service company

Sag River — CS 1-1A

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Sag River below Endicott Bridge	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive	Helicopter/boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming Water dam at low water or small channels	Ice slotting Deflection and containment booming Water dam at low water or small channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 1-1B	None

III. General Site Information

Water Path:	Water Variations:
Sag River flows past the Deadhorse Airport and the site before entering Prudhoe Bay, which is a short distance from the site.	The Sag River rises and falls based on weather in the foothills to the south. It is suscept ble to rain and seasonal influences.
LZ Location: At the site	**Forward Staging Area:** Water injection pad near site Additional sites for storage and response in the area

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
1 Standard Conex, 1 Auxiliary Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat; numerous access points in the area	Tundra and open areas
Location of Nearest Initial Helicopter Refueling Point: Deadhorse Airport	**Utilize Additional Response Resources from:** ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

IV. General Site Description

A boat launch, multiple diversion and containment areas, and other access points are available in the area.

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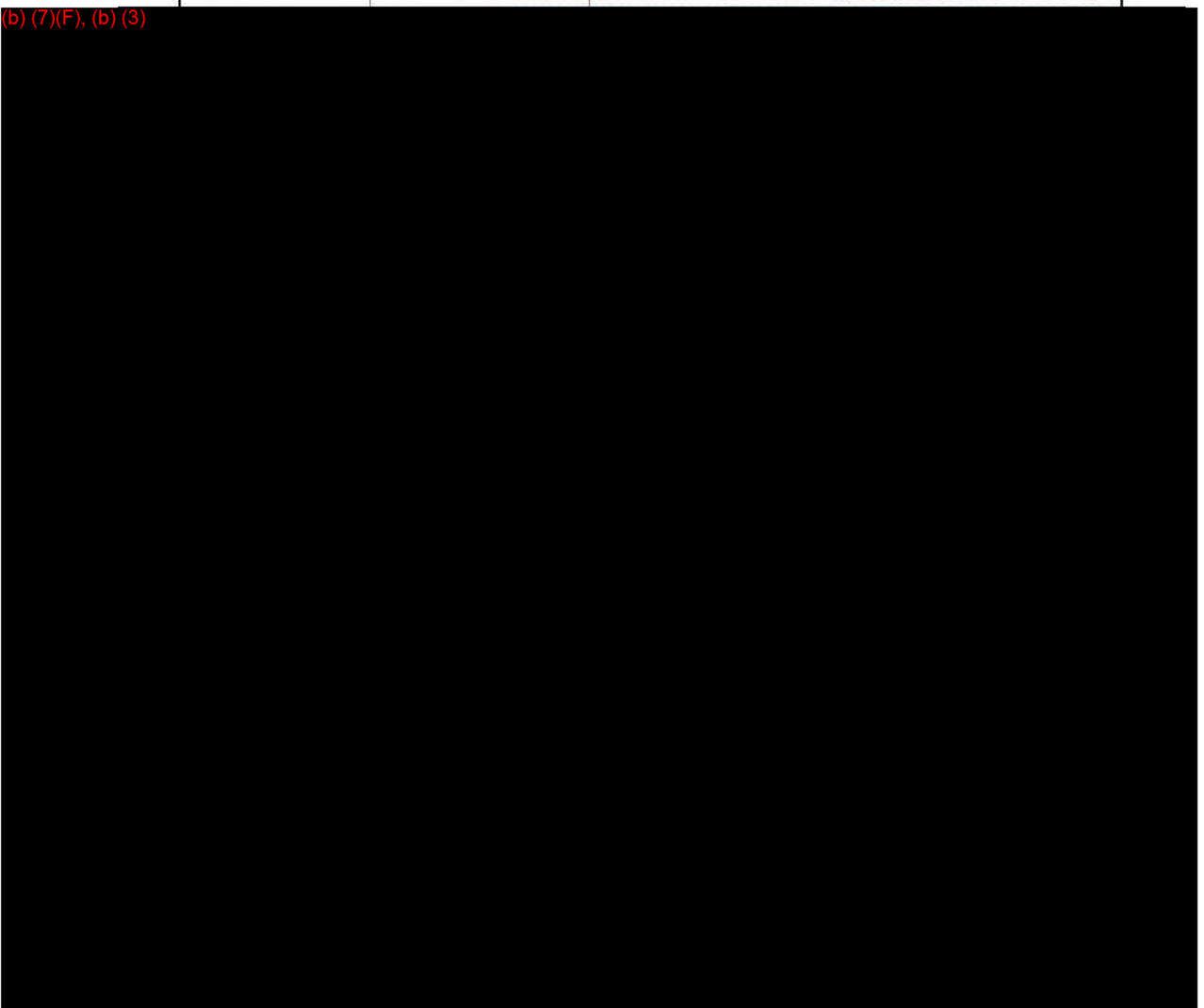
Sag River CS 1-1B

River Data	Staging Areas	Base Map Containment Sites	CS 1-1B Sag River
• Width = 100 - 350 ft. Vairiable/Braided • Velocity = 2 - 4 ft./sec.	• PS 1 • ACS Base • Deadhorse Airport	CS 1-0 CS 1-1 CS 1-1A **CS 1-1B** CS 1-2 CS 1-3	C-Plan Map Ref. 1 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; T Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Sag River near the fire training grounds	(b) (7)	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive	Helicopter/boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and diversion booming	Ice slotting Deflection and diversion booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None in nearby area	CS 1-1A

III. General Site Information

Water Path:	Water Variations:
Sag River flows north along the pipeline route for several miles before reaching the site. River enters Prudhoe Bay approx 3 miles from the site.	The Sag River rises and falls quickly as a result of weather to the south of the site. It is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At the site	Multiple areas near the site ACS Base and airport laydown yards

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra and open areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Deadhorse Airport	ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

IV. General Site Description

The site has a boat launch nearby.

Several areas of opportunity exist upstream of the site.

River Data	Staging Areas	Base Map Containment Sites			CS 1-2 Grayling Gulch
• Width = 3 ft. - 8 ft. • Velocity = 0 - 2 ft./sec.	• PS-1 • ACS Base/Prudhoe Bay • ACS/WOA Base	CS 1-0 CS 1-1B	CS 1-1 **CS 1-2**	CS 1-1A CS 1-3	C Plan Map Ref. 2 Aerial Map Ref. N/A (off corridor) (b) (7)(F), (b) (3) Contact AFSC Land Legal for permitted legal description of this site North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · CS Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Grayling Gulch CS 1-2

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Spine Road crossing of Grayling Gulch	N/A	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Drive	Helicopter/boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Culvert block Containment booming at areas of opportunity downstream of site	Culvert block Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Grayling Gulch flows into Prudhoe Bay below the site.	Grayling Gulch is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At the site	PS01

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra and open areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Deadhorse Airport	ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

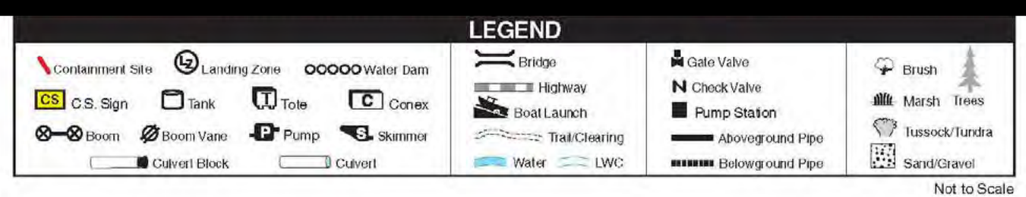
Wildlife Sensitivities: car bou, bears, waterfowl

IV. General Site Description

Grayling Gulch meanders through the area and has several other sites of opportunity to collect oil.

River Data	Staging Areas	Base Map Containment Sites			CS 1-3 Putuligayuk River
• Width = 3 ft. - 30 ft. • Velocity = 1 - 3 ft./sec.	• PS 1 • ACS/WOA Base • ACS Prudhoe Bay Base	CS 1-0 CS 1-1B	CS 1-1 CS 1-2	CS 1-1A **CS 1-3**	C-Plan Map Ref. 1 Aerial Map Ref. 1 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Putuligayuk River — CS 1-3

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Kuparuk Pipeline access road crossing of the Put River	N/A	N/A	(b) (7)(F), (b) (3) ,

Primary Access:	Secondary Access:
Drive	Helicopter/boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming	Ice slotting Snow berming Deflection and containment booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 1-1

III. General Site Information

Water Path:	Water Variations:
Put River flows near PS01 and passes under the Spine Road just past this location.	The Put River ranges from very low, with minimal flow, to full and moderate current. It is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At the site	On pipeline access road and X-pad access road

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
PS01

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra and open areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources From:
Deadhorse Airport	ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

IV. General Site Description

The site has numerous areas of opportunity in the nearby area.

Low marsh, meanders, and ponds are in the area of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 1-4 Sag River
• Width = 3 ft. - 30 ft. • Velocity = 0 - 2 ft./sec.	• ACS Prudhoe Bay Base • PS 1 • 135 APL/AMS-1N	CS 1-4 CS 1-5	C-Plan Map Ref. 3 Aerial Map Ref. 10 & 11 (b) (3), (b) (7)(F) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; T Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Sag River CS 1-4

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Small lake outlet to the Sag River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Drive to area near lake and access site by foot.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Containment booming
Water dam at low water conditions

Winter Response Tactic(s)
Ice slotting
Snow berming
Containment booming

Additional Containment Sites Above this Location:
None in the nearby area

Additional Containment Sites Below this Location:
None in the nearby area
CS 1-1A and CS 1-1B are well downstream.

III. General Site Information

Water Path:
The Sag River flows along the pipeline for several miles.
The river enters Prudhoe Bay well downstream of the site.

Water Variations:
The pond outlet is very small but defined.
High water will overflood banks of the creek.

LZ Location:
At the site

Forward Staging Area:
135 AMS-1S

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Open and flat

Vegetation Conditions at Site:
Tundra and open areas

Location of Nearest Initial Helicopter Refueling Point:
Deadhorse Airport

Utilize Additional Response Resources from:
ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

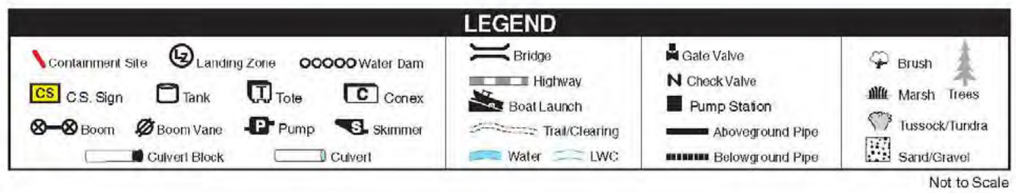
IV. General Site Description

The site is a small outlet to the lake near the Sag River. The outlet can be undefined or braided in places.

There are areas of opportunity along the lake outlet to contain oil.

River Data	Staging Areas	Base Map Containment Sites	CS 1-5 Sag River
• Width = 20 ft. - 100 ft. • Velocity = 1 - 4 ft./sec.	• Work Pad near PLMP 23.5 • PS 1 • ACS Prudhoe Bay	CS 1-4 CS 1-5	C-Plan Map Ref. 4 Aerial Map Ref. 14 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Sag River CS 1-5

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Side channel of the Sag River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming	Ice Slotting Snow berming Containment booming in open areas
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
None	CS 1-1A, CS 1-1B, CS 1-4

III. General Site Information

Water Path:	Water Variations:
The Sag River side channel flows back into the main channel just below the site.	The Sag River is susceptible to rain and seasonal influences.
LZ Location:	**Forward Staging Area:**
At the site	(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra and open areas
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Deadhorse Airport	ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: car bou, bears, waterfowl

IV. General Site Description

The Sag River side channel crosses over the pipeline above the site.

River Data	Staging Areas	Base Map Containment Sites			CS 2-0 Sag River
• Width = 20 ft. - 200 ft. (braided channels) • Velocity = 2 - 8 ft./sec. (variable in channels)	• 125 APL-4 • PS 2 • OMS 125-4	CS 2-0 CS 2-2A	CS 2-1 CS 2-3	CS 2-2 CS 2-4A	C-Plan Map Ref. 9 Aerial Map Ref. 38 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

DHMP 322 PLMP 104

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh
Water Dam	Boat Launch	Pump Station	Trees
CS C.S. Sign	Trail/Clearing	Aboveground Pipe	Tussock/Tundra
Tank	Water	Belowground Pipe	Sand/Gravel
T Tote	LWC		
C Conex			
Boom			
Boom Vane			
P Pump			
S Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Sag River CS 2-0

I. Site Location

(b) (7)(F), (b) (3)

[redacted]

Location Description: LWC at 125 APL-4	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Drive Dalton Hwy to 125 APL-4	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Deploy culvert block and containment booming at road crossing to contain oil above the site.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s): Water dam and containment booming	**Winter Response Tactic(s)** Water Dam Ice slotting Snow berming
Additional Containment Sites Above this Location: CS 2-1, CS 2-2, CS 2-2A	**Additional Containment Sites Below this Location:** None in the nearby area

III. General Site Information

Water Path: Sag River slough is a meander side channel on the Sag River.	**Water Variations:** The Sag River is susceptible to rain and seasonal influences.
LZ Location: On APL road	**Forward Staging Area:** On APL road

Nearest Pump Station/Response Base:

PS02; Conexes are staged at PS02 for part of the year to avoid high-water break-up damage.

Response Equipment On Site (Kits and major items):

1 Standard Conex, 1 Auxiliary Conex, Boom

Stream Bank Conditions at Site: Stable and flat	**Vegetation Conditions at Site:** Open areas above and below the APL crossing
Location of Nearest Initial Helicopter Refueling Point: PS02	**Utilize Additional Response Resources from:** PS03

Communications Resources Available:

VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bears, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 2-1 Dan Creek
• Width = 20 ft. - 60 ft. • Velocity = 2 - 7 ft./sec.	• Happy Valley Airport • CKV 19/MGV 19A • 122 AMS-3A • PS 3 • 125 APL-4	CS 2-0 **CS 2-1** CS 2-2 CS 2-2A CS 2-3 CS 2-4A	C-Plan Map Ref. 10 Aerial Map Ref. 44 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dan Creek CS 2-1

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Dalton Highway where Dan Creek meets the Sag River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive – on 125 APL-4	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming with water dams at low water	Snow berming and ice slotting
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
None	Sag River areas downstream

III. General Site Information

Water Path:	Water Variations:
Dan Creek crosses under the pipeline at this site and enters the Sag River below this site.	Dan Creek is susceptible to rain and seasonal influences, with some push back from the Sag River.
LZ Location:	**Forward Staging Area:**
On 125 APL-4	On 125 APL-4

Nearest Pump Station/Response Base:
PS02

Response Equipment On Site (Kits and major items):
2 Auxiliary Conexes, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open	Open tundra
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Deadhorse	ACS Base

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 2-2 Lori Creek
• Width = 0 ft. - 10 ft. • Velocity = 0 - 2 ft./sec.	• PS 3 • 123 APL-2 • Work Pad	CS 2-0 CS 2-1 **CS 2-2** CS 2-2A CS 2-3 CS 2-4A	C-Plan Map Ref. 10 Aerial Map Ref. 44 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | CS C.S. Sign | Tank | T Tote | C Conex | Boom | Boom Vane | P Pump | S Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | N Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Lori Creek CS 2-2

I. Site Location

Location Description:
Dalton Highway Crossing of Lori Creek (b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive site is on 123 APL-2

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Water dam, boom at high water possibly

Winter Response Tactic(s)
Snow berming and water dam at open water season

Additional Containment Sites Above this Location:
CS 2-2, CS 2-3

Additional Containment Sites Below this Location:
CS 2-1

III. General Site Information

Water Path:
Lori Creek flows under the pipeline and into the Sag River in this area.

Water Variations:
Lori Creek is susceptible to rain and seasonal influences.

LZ Location:
On 123 APL-2

Forward Staging Area:
On 123 APL-2

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
Sandbags, Underflow Dam Kit, Visqueen

Stream Bank Conditions at Site:
Flat and open

Vegetation Conditions at Site:
Flat and open

Location of Nearest Initial Helicopter Refueling Point:
Deadhorse

Utilize Additional Response Resources from:
ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

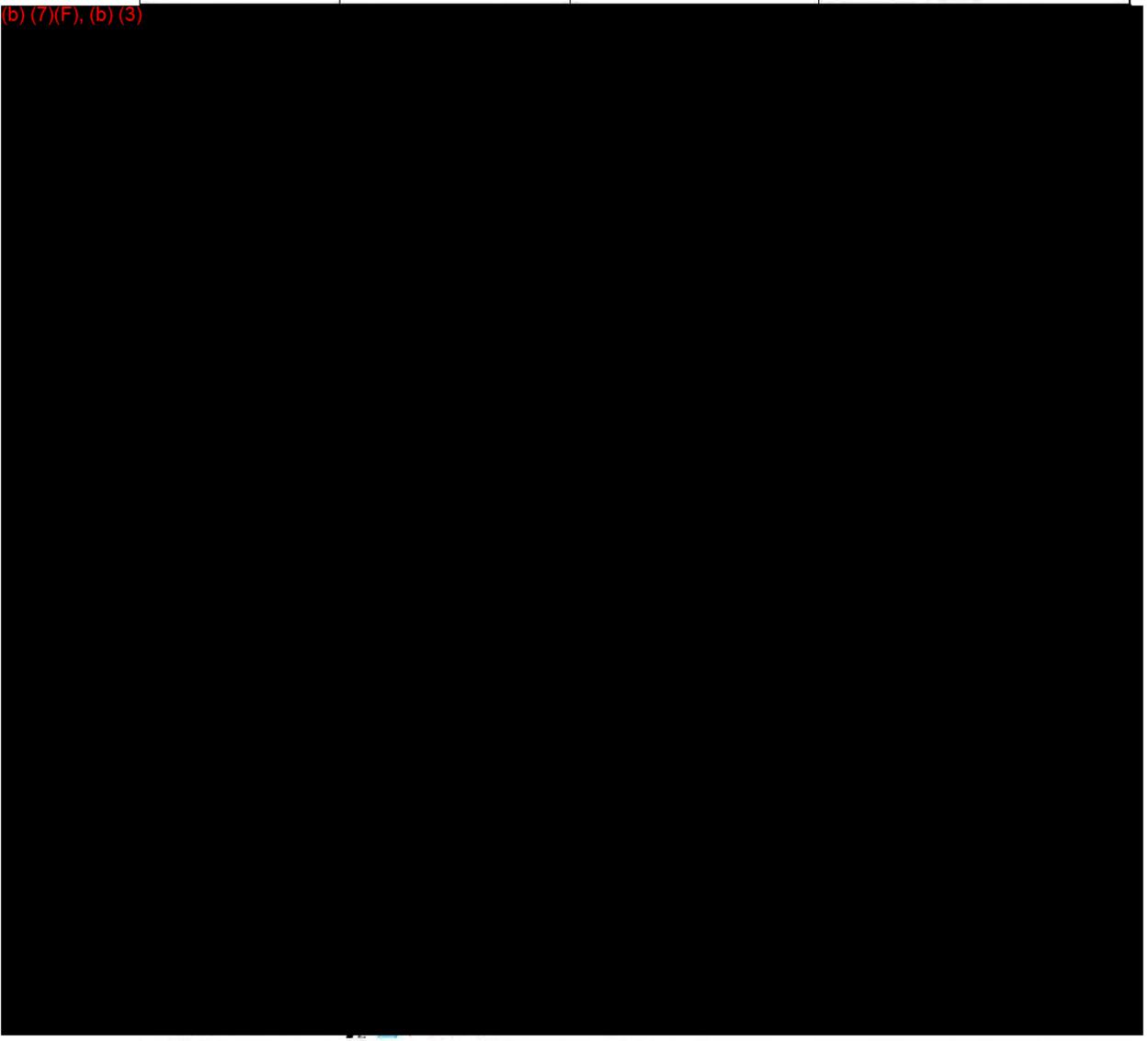
Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 2-2A Lori Creek
• Width = 0 ft. - 10 ft. • Velocity = 0 - 2 ft./sec.	• PS 3 • 123 APL-2 • Work Pad	CS 2-0 CS 2-1 CS 2-2 **CS 2-2A** CS 2-3 CS 2-4A	C-Plan Map Ref. 10 Aerial Map Ref. 45 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline service company

Lori Creek — CS 2-2A

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Dalton Hwy Crossing of Lori Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive- Dalton Highway to 123 APL-2

Helicopter.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Water dam and booming depending on water levels

Winter Response Tactic(s)
Snow berming
Water dam and booming depending on season

Additional Containment Sites Above this Location:
CS 2-3

Additional Containment Sites Below this Location:
CS 2-2

III. General Site Information

Water Path:
Lori Creek crosses over the pipeline at this site and enters the Sag River 1.5 miles below the site.

Water Variations:
Lori Creek is susceptible to rain and seasonal influences.

LZ Location:
At site on ROW

Forward Staging Area:
At site on ROW

Nearest Pump Station/Response Base:
PS01

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open
Part of a LWC at pipeline

Vegetation Conditions at Site:
Open walking area

Location of Nearest Initial Helicopter Refueling Point:
Deadhorse Airport

Utilize Additional Response Resources from:
ACS Prudhoe Bay, PS02

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bears, fox, eagles

IV General Site Description

Site has many areas of opportunity nearby.

Alyeska pipeline SERVICE COMPANY

Unnamed Creek CS 2-3

River Data	Staging Areas	Base Map Containment Sites	CS 2-3 Unnamed Creek/Sag River
• Width = 3 ft. - 10 ft. • Velocity = 0 - 2 ft./sec.	• PS 3 • 122 APL-5 • Work Pad near PLMP 88	CS 2-0 CS 2-1 CS 2-2 CS 2-2A **CS 2-3** CS 2-4A	C-Plan Map Ref. 10, 11 Aerial Map Ref. 46 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) (A)

[redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; T Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
0.6 Miles to the Left of the Dalton Hwy

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter to LZ

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):
Booming and water dam containment at mouth of creek

Winter Response Tactic(s)
Ice slotting
Booming in open areas

Additional Containment Sites Affected Above this Location:
None

Additional Containment Sites Below this Location:
CS 2-2, CS 2-2A

III. General Site Information

Water Path:
There is a small lake along the pipeline where Unnamed Creek exits and enters Lori Creek below the site.

Water Variations:
Unnamed Creek is susceptible to rain and seasonal influences.

LZ Location:
At site

Forward Staging Area:
Near 125 APL-5

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
Skorboom Tote, , Sandbag Kit, Underflow Dam Kit, Lumber/Plywood

Stream Bank Conditions at Site:
Flat and open area

Vegetation Conditions at Site:
Flat and open area

Location of Nearest Initial Helicopter Refueling Point:
Deadhorse Airport

Utilize Additional Response Resources from:
PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagles

IV. General Site Description

There are many areas to contain oil downstream of this site.

River Data	Staging Areas	Base Map Containment Sites			CS 2-4A Unnamed Creek
• Width = 10 ft. - 30 ft. • Velocity = 0 - 2 ft./sec.	• PS 3 • Work Pad near PLMP 93	CS 2-0 CS 2-2A	CS 2-1 CS 2-3	CS 2-2 **CS 2-4A**	C-Plan Map Ref: 11 Aerial Map Ref 47 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | CS Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek CS 2-4A

I. Site Location

Location Description:
Dalton Hwy Crossing of Unnamed Creek

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive-on highway ROW

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Culvert Blocking and boom

Winter Response Tactic(s)
Snow berming
Culvert block

Additional Containment Sites Affected Above this Location:
None

Additional Containment Sites Below this Location:
CS 2-0 is well downstream

III. General Site Information

Water Path:
Unnamed Creek passes over the pipeline just upstream of the site and enters the Sag River below the site.

Water Variations:
Unnamed creek is suscept ble to rain and seasonal influences.

LZ Location:
On west side of highway at the crossing

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex, Boom, Sandbags, Culvert Block Kit

Stream Bank Conditions at Site:
Clear and flat

Vegetation Conditions at Site:
Open walking area all around

Location of Nearest Initial Helicopter Refueling Point:
Deadhorse Airport

Utilize Additional Response Resources from:
PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagles

IV. General Site Description

The site has several areas to contain oil above the highway. Unnamed Creek enters the Sag River directly below the highway crossing.

River Data	Staging Areas	Base Map Containment Sites			CS 2-5 Sag River
• Width = 20 ft. - 80 ft. (braided channels) • Velocity = 2 - 8 ft./sec. (variable in channels)	• PS 3 • 121 APL-1	CS 2-5 CS 2-7	CS 2-6 CS 2-8	CS 2-6A	C-Plan Map Ref. 12 Aerial Map Ref. 51 (b) (7)(F), (b) (3) Contact AK SC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Sag River

CS 2-5

(b) (7)(F), (b) (3)

I. Site Location

Location Description: On 121 APL-1 at Sag River channel	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Drive – Dalton Hwy to 121 APL-1	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Utilize the boom vanes to divert oil to containment and recovery sites.

Deploy recovery and transfer systems at associated containment sites.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s): Deflection and containment booming	**Winter Response Tactic(s)** Ice slotting and snow berming Deflection and containment booming
Additional Containment Sites Affected Above this Location: CS 2-6, CS 2-6A, CS 2-7, CS 2-8	**Additional Containment Sites Below this Location:** CS 2-0 is well downstream of the site.

III. General Site Information

Water Path: Side channel of the Sag River just north of Rudy Creek	**Water Variations:** The Sag River rises and falls quickly due to many braided channels. It is susceptible to rain and seasonal influences.
LZ Location: On APL or nearby sandbars	**Forward Staging Area:** 121 APL-1

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
1 Standard Conex, 1 Auxiliary Conex, Boom

Stream Bank Conditions at Site: Flat and open. Some cut bank in the area	**Vegetation Conditions at Site:** Open walking in area
Location of Nearest Initial Helicopter Refueling Point: Deadhorse Airport	**Utilize Additional Response Resources from:** PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagles

IV. General Site Description

The site is on APL that has been cut by the site channel.

Many areas of opportunity to contain oil exist upstream of site.

Diversion booming in main channel may utilize boom vanes.

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Sag River

CS 2-6

River Data	Staging Areas	Base Map Containment Sites	CS 2-6 Sag River
• Width = 20 - 200 ft. • Velocity = 1 - 6 ft./sec.	• PS 3 • 121 APL-1	CS 2-5 **CS 2-6** CS 2-6A CS 2-7 CS 2-8	C-Plan Map Ref. 12 Aerial Map Ref. 51 (b) (7)(F), (b) (3) Contact AP-SC Land/Legal for permitted legal description of this site.

North



LEGEND

Containment Site, Landing Zone, Water Dam, CS C.S. Sign, Tank, T Tote, C Conex, Boom, Boom Vane, P Pump, S Skimmer, Culvert Block, Culvert, Bridge, Highway, Boat Launch, Trail/Clearing, Water, LWC, Gate Valve, N Check Valve, Pump Station, Aboveground Pipe, Belowground Pipe, Brush, Marsh, Trees, Tussock/Tundra, Sand/Gravel

Not to Scale

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Approx. 1/8 mile to the right of the Dalton Highway	(b) (7)(F), (b) (3)
Primary Access: Drive – on highway	**Secondary Access:** Helicopter to river bank

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming	Ice berming and slotting Deflection and containment booming
Additional Containment Sites Affected Above this Location: Cs 2-6A, CS 2-7, CS 2-8, and others well upstream	**Additional Containment Sites Below this Location:** CS 2-5

III. General Site Information

Water Path:	Water Variations:
Sag River side channel near the highway (One of many places to establish containment at along the Dalton Highway.)	The Sag River is susceptible to rain and seasonal influences. Several channels will go dry when water levels are low.
LZ Location: On site – many other LZs at areas of opportunity	**Forward Staging Area:** 121 API-1

Nearest Pump Station/Response Base: PS03

Response Equipment On Site (Kits and major items): None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Open and flat
Location of Nearest Initial Helicopter Refueling Point: Deadhorse Airport	**Utilize Additional Response Resources from:** PS03, ACS Prudhoe Bay

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagles, fox

IV. General Site Description

The site is on a large side channel to the Sag River. Low water may indicate the channel is dry or has low water levels, and boom must be placed farther out in other channels upstream.

River Data	Staging Areas	Base Map Containment Sites	CS 2-6A Rudy Creek
• Width = 20 - 50 ft. • Velocity = 0 - 2 ft./sec.	• PS 3 • 121 APL-1 • 120 AMS-20	CS 2-5 CS 2-6 **CS 2-6A** CS 2-7 CS 2-8	C-Plan Map Ref. 12 Aerial Map Ref. 51 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; T Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Rudy Creek CS 2-6A

I. Site Location

Location Description:	GPS Coordinates:
Rudy Creek Crossing of the Dalton Highway	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive on highway ROW	Helicopter to site

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Establish water dam containment at sites where oil recovery can be optimized.

Establish culvert block containment to maximize recovery options.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Deploy deflection boom to divert oil to containment and recovery areas.

Deploy culvert block and containment booming at road crossing to contain oil above the site.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming	Ice slotting Snow berming Containment booming in open areas

Additional Containment Sites Affected Above this Location:	Additional Containment Sites Below this Location:
None	CS 2-6, CS 2-5

III. General Site Information

Water Path:	Water Variations:
Rudy Creek passes under the pipeline just upstream of the site. The creek flows into the Sag River a short distance from the site.	Rudy Creek is susceptible to rain and seasonal influences. The stream will increase when rains occur.

LZ Location:	Forward Staging Area:
On W side of highway crossing.	121 APL-1

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open areas at both sides of the highway	Open tundra

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Deadhorse Airport	PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

The site is comprised of several culverts that flow at different water levels depending on the season.

Numerous areas of opportunity to contain oil exist above the highway crossing.

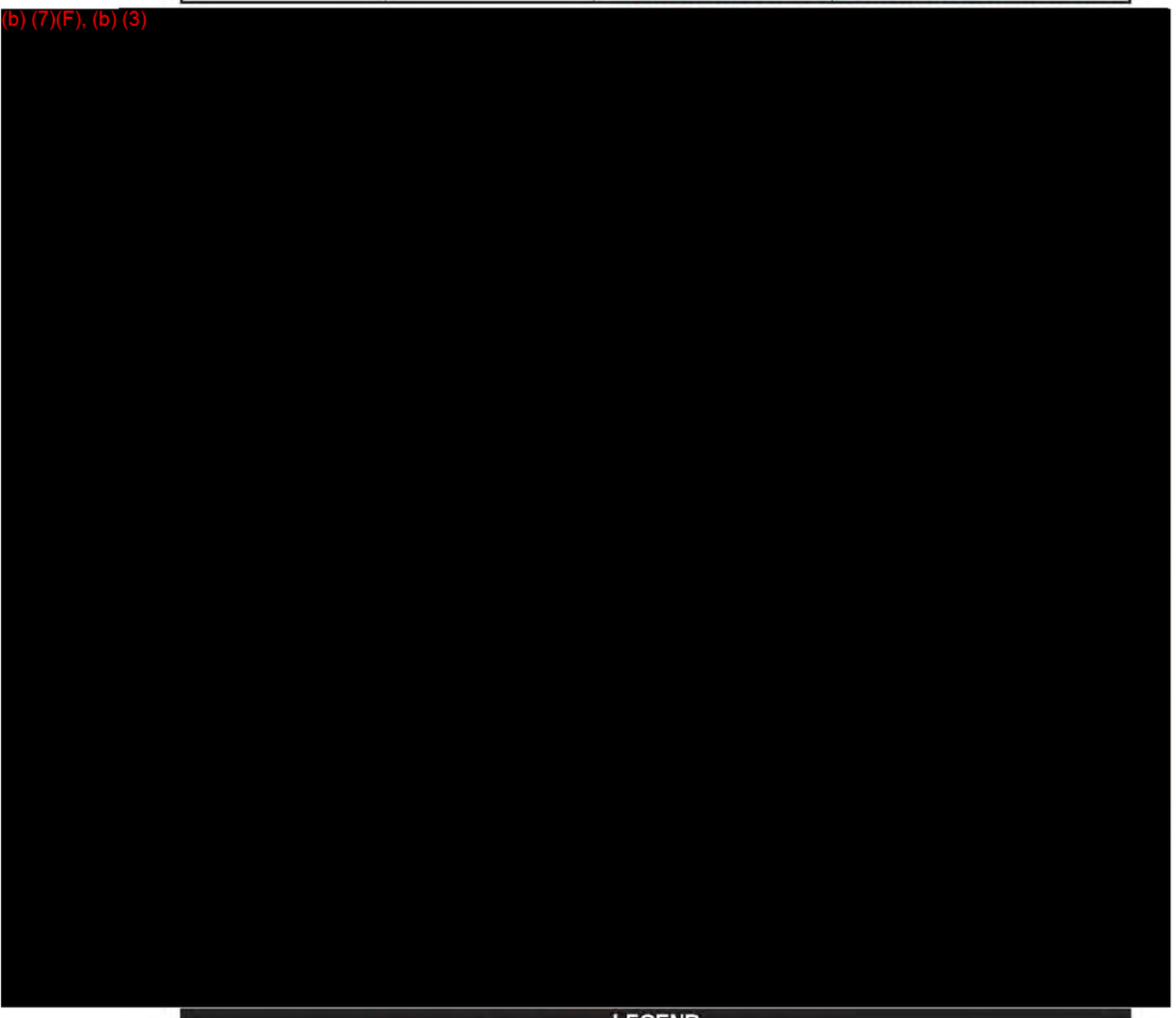
There are gravel bars at the mouth of the Sag River/creek confluence from which to stage.

Alyeska pipeline SERVICE COMPANY

Sag River CS 2-7

River Data	Staging Areas	Base Map Containment Sites	CS 2-7 Sag River
• Width = 75 - 300 ft. • Velocity = 2 - 6 ft./sec.	• PS 3 • 120 AMS-20	CS 2-5 CS 2-6 CS 2-6A **CS 2-7** CS 2-8	C-Plan Map Ref. 12 Aerial Map Ref. 51 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)





Not to Scale

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Sag River near 120 AMS -20	(b) (7)(F), (b) (3)
Primary Access:	
Drive – Dalton Hwy to 120 AMS-20	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish storage and transfer operations at recovery sites.
Utilize the boom vanes to divert oil to containment and recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming	Ice slotting Deflection and containment booming
Additional Containment Sites Affected Above this Location:	**Additional Containment Sites Below this Location:**
None in the immediate area	CS 2-6, CS 2-5

III. General Site Information

Water Path:	Water Variations:
Sag River side channel with numerous other areas of opportunity nearby	The Sag River is susceptible to rain and seasonal influences. Low water may eliminate channel or make it too small for booming.
LZ Location:	**Forward Staging Area:**
On 120- APL-20	On 120- APL-20

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Good access, some cut bank but generally level and stable	Open tundra and wa king areas
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Deadhorse Airport	PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

The site is on a large side channel of the Sag River. Additional containment and deflection activity will take place upstream and divert oil to this location.

Additional sites of opportunity are located along this bank.

River Data	Staging Areas	Base Map Containment Sites	CS 2-8 Oks Creek
• Width = 2 ft. to 20 ft. • Velocity = 1-3 ft./sec.	• PS 3 • Work Pad @ PLMP 103 • 121 APL-1	CS 2-5 CS 2-6 CS 2-6A CS 2-7 **CS 2-8**	C-Plan Map Ref. 12 Aerial Map Ref. 59 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Oks Creek (b) (7)(F), (b) (3) CS 2-8

I. Site Location

Location Description:		GPS Coordinates:
Pipeline crossing of Oks Creek		(b) (7)(F), (b) (3)
Primary Access: Drive – On ROW	**Secondary Access:** Helicopter	

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water dam and booming downstream of the site	Ice slotting Snow berming Water dam in open areas
Additional Containment Sites Affected Above this Location: None	**Additional Containment Sites Below this Location:** CS 2-6A, CS 2-6, CS 2-5

III. General Site Information

Water Path:	Water Variations:
Oks Creek crosses under the pipeline at the site. The creek then joins Rudy Creek downstream and enters the Sag River shortly thereafter.	Oks Creek is susceptible to rain and seasonally influences. The site is LWC of the ROW and will go dry.
LZ Location: On ROW north of the site	**Forward Staging Area:** On ROW north of the site

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
Culvert Block Kits, Sandbags

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gradual and stable soil and gravel Site is part of ROW enhancements	Open and easy walking all around
Location of Nearest Initial Helicopter Refueling Point: PS04, Deadhorse Airport	**Utilize Additional Response Resources from:** PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

The site is LWC crossing of pipe pad. Numerous areas are available for other containment below the crossing.

Portable pipeline storage systems can be used to move oil at sites of opportunity downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 3-2 Unnamed Drainage
• Width = 2 ft. - 20 ft. • Velocity = 0 - 2 ft./sec.	• PS 3 • OMS 119-4/DOT Camp	CS 2-8 **CS 3-2** CS 3-3 CS 3-3A CS 3-4 CS 3-9	C-Plan Map Ref. 13 Aerial Map Ref. 57 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Drainage — CS 3-2

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Approx. 1/8 mile to the left of the Dalton Hwy

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter.

Helicopter.
May be able to walk in.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Containment boom and water dam at areas of opportunity along drainage

Winter Response Tactic(s)
Ice slotting
Snow berming
Containment boom and water dam at areas of opportunity along drainage

Additional Containment Sites Affected Above this Location:
None

Additional Containment Sites Below this Location:
None in the immediate area

III. General Site Information

Water Path:
Unnamed Drainage flows near the pipeline. The drainage is the outlet stream of a small pond nearby.

Water Variations:
Unnamed Drainage is suscept ble to lake, rain and seasonal influences.

LZ Location:
At site and areas of opportunity

Forward Staging Area:
119 APL-1

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open along banks
Some bog and wetlands nearby

Vegetation Conditions at Site:
Open walking and access to stream
Tundra and small tussocks in the area

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03

Communications Resources Available:
VHF, ARTS, satellite phone

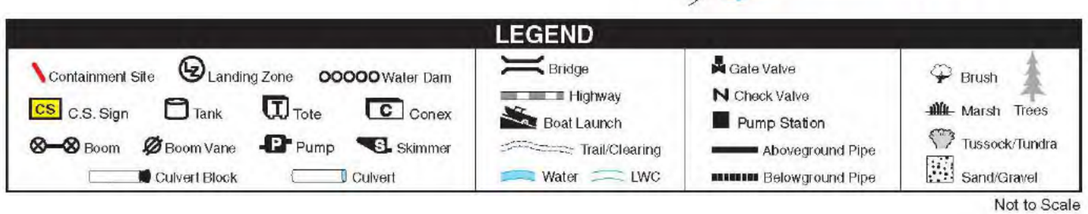
Wildlife Sensitivities: Car bou, bear, fox, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 3-3 Unnamed Drainage
• Width = 4 - 20 ft. • Velocity = 1 - 3 ft./sec.	• PS 3 • Hwy. Pullout • 119 APL-3 (DOT Camp)	CS 2-8 CS 3-2 **CS 3-3** CS 3-3A CS 3-4 CS 3-9	C-Plan Map Ref. 12, 13 Aerial Map Ref. 55 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Drainage — CS 3-3

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Unnamed Drainage Crossing of the Dalton Hwy

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive-site is on Hwy ROW

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish culvert block containment to maximize recovery options.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Culvert blocking, boom, and water dam at high and low water levels

Winter Response Tactic(s)
Ice slotting
Snow berming
Culvert blocking

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Unnamed Drainage flows under the pipeline above the site and enters the Sag River approximately 1.4 miles downstream of the site.

Water Variations:
Unnamed Drainage is suscept ble to rain and seasonal influences.

LZ Location:
On highway pullout just to the north of the site or any open ground nearby

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
Sandbags

Stream Bank Conditions at Site:
Site is a culvert crossing with open ground above and below the site.

Vegetation Conditions at Site:
Open and clear around culvert

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

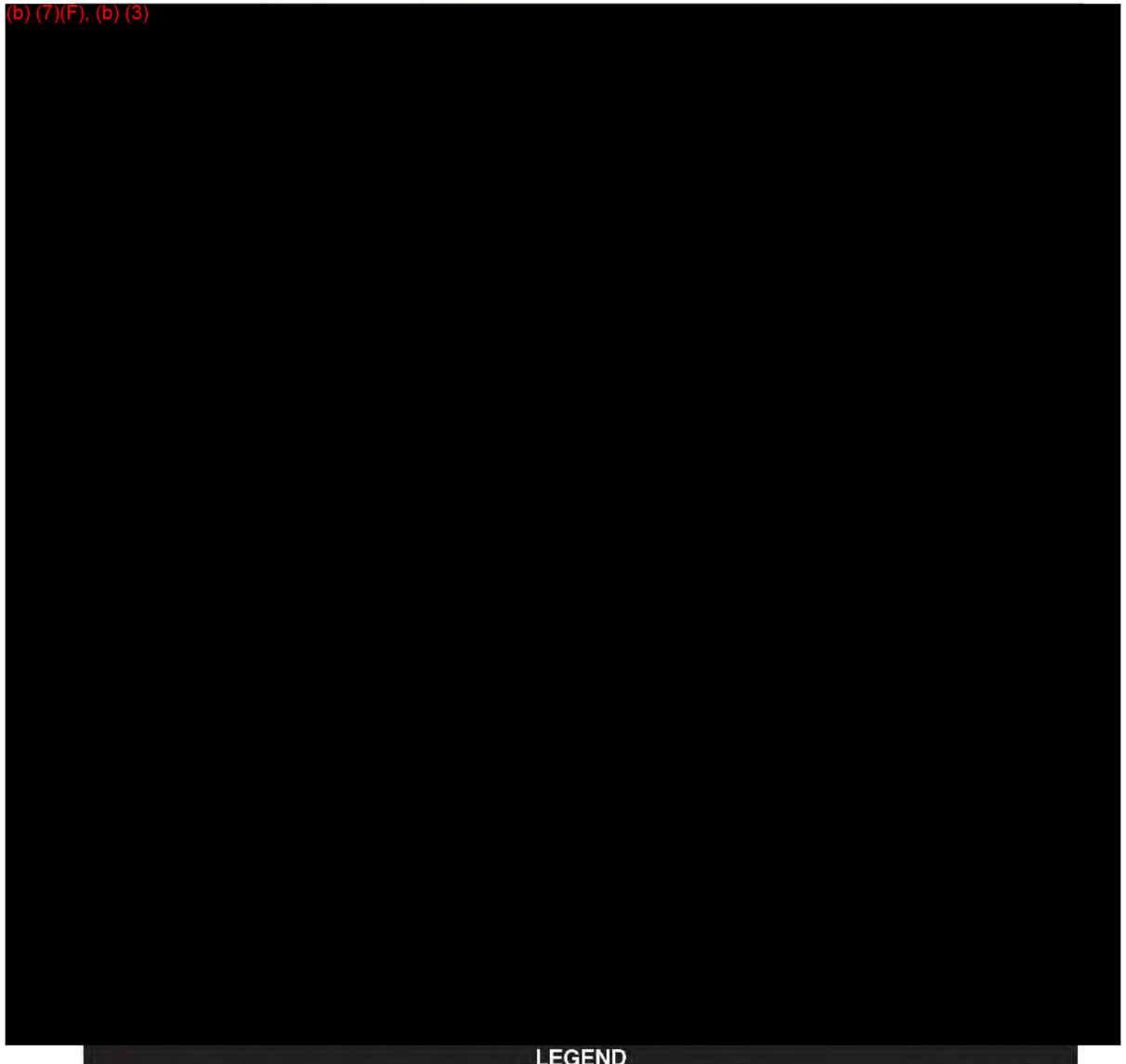
The site has three culverts crossing the highway (one @ 4' and two @ 2' diameter). The two smaller culverts are primarily for overflow conditions but may be impacted if a water dam is used.

Numerous areas may be utilized to contain and recover oil above the highway.

Consider the use of a portable pipeline at sites above the highway.

River Data	Staging Areas	Base Map Containment Sites	CS 3-3A Oks Creek
• Width = 10 ft. - 50 ft. • Velocity = 1 - 4 ft./sec.	• PS 3 • OMS 119-4/DOT Camp • 119 APL-1	CS 2-8 CS 3-2 CS 3-3 **CS 3-3A** CS 3-4 CS 3-9	C-Plan Map Ref. 13 Aerial Map Ref. 57, 58 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Oks Creek CS 3-3A

I. Site Location

Location Description:		GPS Coordinates:
Oks Creek near the Dalton Highway	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)
Primary Access: Helicopter	**Secondary Access:** Walk in from highway	

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Establish water dam containment at sites where oil recovery can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming at numerous areas of opportunity in the immediate location.	Booming with water dams and snow berms in low water areas
Additional Containment Sites Affected Above this Location: CS 3-4, CS 3-9	**Additional Containment Sites Below this Location:** CS 2-8 in the near area

III. General Site Information

Water Path:	Water Variations:
Oks Creek flows back and forth across the pipeline for several miles.	Rain and seasonal influenced
LZ Location: At site or in areas of opportunity nearby	**Forward Staging Area:** 119 APL-1

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex, Boom, Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and gradual Many gravel bars and other sites from which to stage containment	Tundra with open walking
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

The site is part of a drainage system for the surrounding area and has several small inlets in the area. Many sites of opportunity exist, with gravel bars and creek bends to deflect oil.

A portable pipeline may be used to transfer recovered oil to the highway, if not back to the work pad.

River Data	Staging Areas	Base Map Containment Sites	CS 3-4 Oks Creek
• Width = 0 - 5 ft. • Velocity = 1 - 3 ft./sec.	• PS 3 • Work Pad @ PLMP 117.1 & 117 • 119 APL-3 (DOT Camp)	CS 2-8 CS 3-2 CS 3-3 CS 3-3A **CS 3-4** CS 3-9	C-Plan Map Ref. 13 Aerial Map Ref. 60 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Oks Creek — CS 3-4

I. Site Location

Location Description:
Oks Creek Crossing of the Work Pad

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive –On ROW

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):
Booming and water dam at ROW

Winter Response Tactic(s)
Snow berming,
Water dam

Additional Containment Sites Above this Location:
CS 3-9

Additional Containment Sites Below this Location:
CS 3-3A

III. General Site Information

Water Path:
Oks Creek flows back and forth across the pipeline in this area.

Water Variations:
Oks Creek is susceptible to rain and seasonal influences.

LZ Location:
On ROW south of stream crossing

Forward Staging Area:
On ROW near site

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex, Boom, Underflow Dam Kit

Stream Bank Conditions at Site:
Easy access, flat and open

Vegetation Conditions at Site:
Tundra, some grade to approach at ROW but generally flat

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

The site is LWC on the pipeline pad.

Several areas of opportunity exist upstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 3-5 Toolik River Tributary
• Width = 3 - 8 ft. • Velocity = 1 - 3 ft./sec.	• 118 APL-1 • PS 3	CS 3-4 **CS 3-5** CS 3-7 CS 3-9	C-Plan Map Ref. 13 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] Contact AP-SC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

CS 3-5

(b) (7)(F), (b) (3) [redacted]

I. Site Location

Location Description: Where Two Tributaries of the Toolik River meet	**GPS Coordinates:** (b) (7)(F), (b) (3) [redacted]
Primary Access: Helicopter	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s): Water dam and containment booming depending on water levels	**Winter Response Tactic(s)** Water dam Snow berming Oil may not reach this site due to the distance from the pipeline (approx. 4.5 miles).
Additional Containment Sites Affected Above this Location: CS 3-7	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path: Two Toolik River tributaries meet just above the site. Toolik River continues away from the pipeline from the site.	**Water Variations:** Toolik River is susceptible to rain and seasonal influences. The river can be very low and spotty, to full and well flowing.
LZ Location: At site	**Forward Staging Area:** 118 APL-1

Nearest Pump Station/Response Base: PS04

Response Equipment On Site (Kits and major items): None

Stream Bank Conditions at Site: Well defined and flat River may have a 1- to 3-foot drop to water level	**Vegetation Conditions at Site:** Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04 and ACS Prudhoe Bay

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

The site is approximately 4.5 miles from the pipeline.

Many areas of opportunity exist above the site on either this or one of the two tributaries.

River Data	Staging Areas	Base Map Containment Sites	CS 3-6 Toolik River
• Width = 10 ft. - 30 ft. Heavily Braided • Velocity = 1 - 4 ft./sec.	• PS 3 • PLMP 98	CS 2-4A **CS 3-6**	C-Plan Map Ref. 11 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Toolik River

CS 3-6

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Toolik River	Not applicable	Not applicable	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water dam and containment booming	Water dam and containment booming Oil may not reach the site in winter due to the distance from the pipeline.

Additional Containment Sites Affected Above this Location:	Additional Containment Sites Below this Location:
Not applicable	Not applicable

III. General Site Information

Water Path:	Water Variations:
Toolik River is fed by many creeks and drainages that cross the pipeline corridor.	Multiple braided channels reach across the river bed. Toolik River is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At site	122 API/AMS-1

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and stable banks Some cut bank areas at high water mark Many access points along upstream and downstream locations	Tundra, open walking with some small brush along creek

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS04, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagle

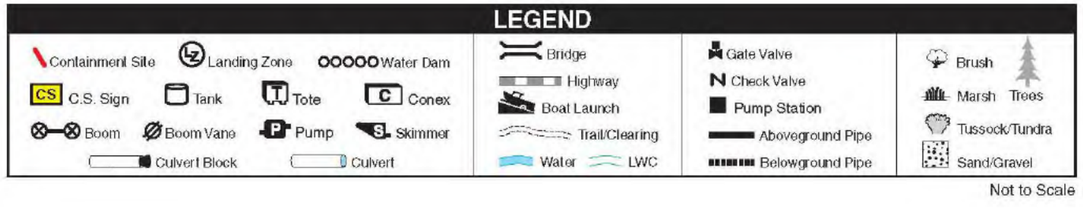
IV. General Site Description

The site is a wide, flat plain of braided channels. Deflection will have to take place upstream to divert to a single channel or location.

There are many additional sites in the area from which to stage.

River Data	Staging Areas	Base Map Containment Sites			CS 3-7 Toolik River Tributaries
• Width = 5 - 30 ft. • Velocity = 0 - 2 ft./sec.	• Work Pad near PLMP 121 • 118 APL-1 • PS 3	CS 3-4	CS 3-7	CS 3-9	C-Plan Map Ref. 13 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land Dept for permitted legal description of this site North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Toolik River Tributaries

CS 3-7

I. Site Location

Location Description:		GPS Coordinates:
Confluence of two Toolik River tributaries (b) (7)(F), (b) (3)		(b) (7)(F), (b) (3)
Primary Access: Helicopter	Helicopter	

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment boom and water dam at areas of opportunity in the area	Booming and water dam Oil may not reach the site due to distance from the pipeline.
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 3-5

III. General Site Information

Water Path:	Water Variations:
Toolik River tributaries meet just above this location.	Toolik river is susceptible to rain and seasonal influences. It is often dry or not flowing in many areas.
LZ Location: At site	**Forward Staging Area:** 118 APL-1

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and stable	Open tundra area with bluffs in the distance
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

The site is at a confluence of two tributaries, and Its banks are defined but flat. Some overflow areas have been observed along the upper end of one tributary.

The site has several additional areas to contain oil.

River Data	Staging Areas	Base Map Containment Sites	CS 3-8 Toolik River
• Width = 10 - 30 ft. • Velocity = 0 - 3 ft./sec.	• 119A APL/AMS-3 • PLMP 111 • PS 3	CS 3-3 **CS 3-8**	C-Plan Map Ref. 13 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Toolik River — CS 3-8

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Toolik River	Not applicable	Not applicable	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment boom and water dam depending on water levels	Snow berming and ice slotting Containment boom and water dam depending on water levels Oil may not reach the site in winter due to the distance from the pipeline.
Additional Containment Sites Affected Above this Location: None in the area	**Additional Containment Sites Below this Location:** None in the area

III. General Site Information

Water Path:	Water Variations:
Toolik River drains a number of creeks and drainages that cross the pipeline.	Toolik River is susceptible to rain and seasonal influences. The large, flat drainage area is susceptible to flooding at high water.
LZ Location: At site	**Forward Staging Area:** OMS 119.4 119A APL/AMS-3

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and stable 1-4' to water level with some steep banks	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04, ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

The site is on high banks above river. A large lake nearby may breach over the site at high-water periods.

River Data	Staging Areas	Base Map Containment Sites	CS 3-9 Oks Creek
• Width = 6 - 20 ft. • Velocity = 1 - 4 ft./sec.	• PS 3 • Hwy. Pullout @ 297.8 • 118 APL-1	CS 2-8 CS 3-2 CS 3-3 CS 3-3A CS 3-4 **CS 3-9**	C-Plan Map Ref. 13 Aerial Map Ref. 60 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Oks Creek — CS 3-9

I. Site Location

Location Description:	(b) (7)(F), (b) (3)	GPS Coordinates:
Oks Creek crossing of the Dalton Highway	[redacted]	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Drive – site on Highway ROW	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites

Summer Response Tactic(s):	Winter Response Tactic(s)
Culvert block and water dam at low water Booming at higher water	Culvert block Snow berming Ice trenching

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 3-4

III. General Site Information

Water Path:	Water Variations:
Oks Creek flows across the pipeline upstream and below the site.	Oks Creek is typically low and is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At site near highway crossing	118 APL-1

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex, Sandbags, Boom, Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Open and flat

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS04 ACS Prudhoe Bay

Communications Resources Available:
VHF, ARTS, satellite phone

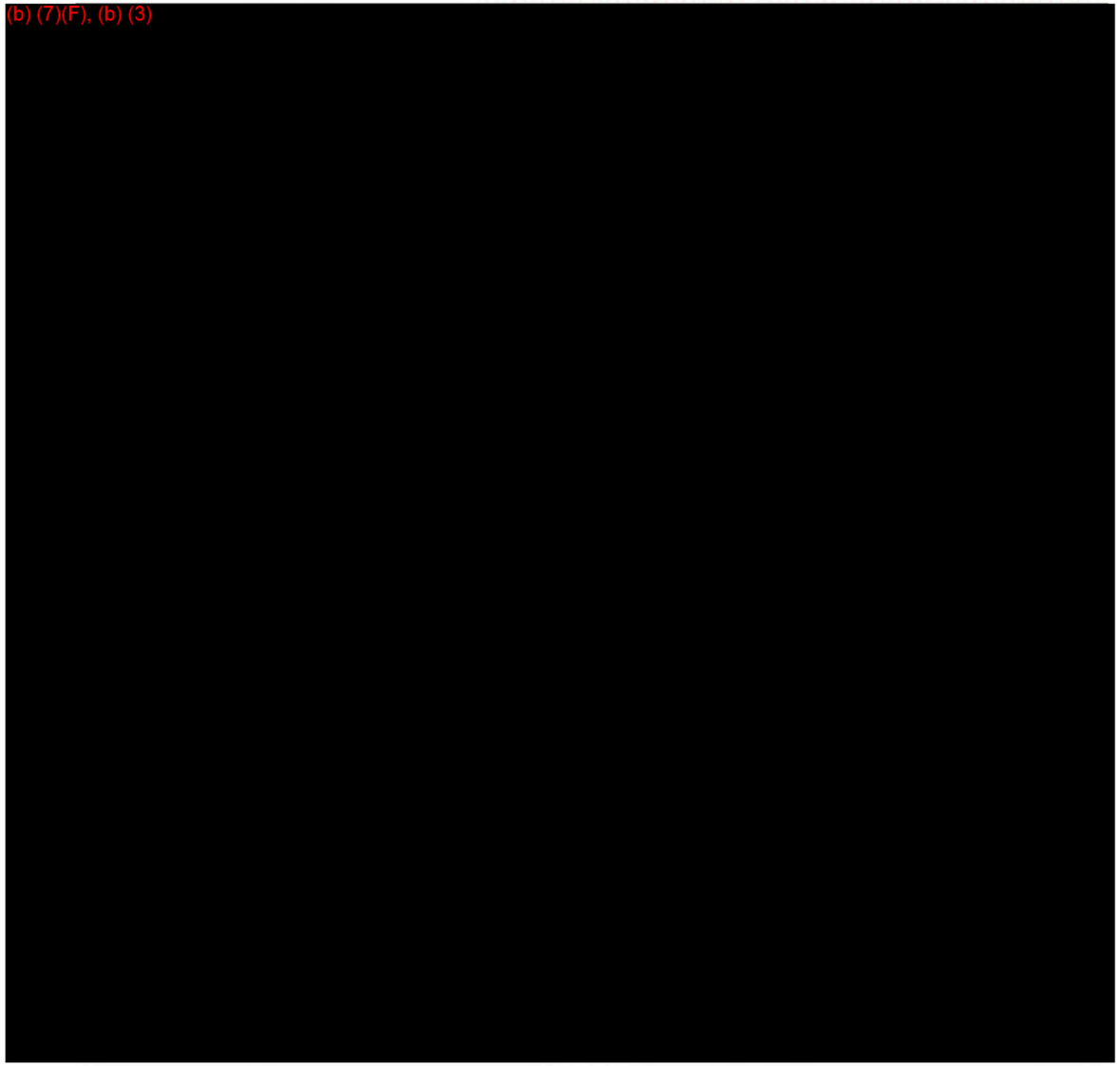
Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

The site has two culverts with some pond area near the inlet and outlets.

Numerous sites of opportunity are present downstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 3-11 East Fork Kuparuk River
• Width = 2 - 30 ft. • Velocity = 1 - 3 ft./sec.	• PS 3 & 4 • 117 AMS-1 • Work Pad near PLMP 125	**CS 3-11** CS 3-12 CS 3-13 CS 3-14 CS 3-15 CS 6-15A CS 3-16 CS 3-17 CS 3-18 CS 3-19	C-Plan Map Ref. 13, 13W Aerial Map Ref. 64 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

East Fork Kuparuk River — CS 3-11

I. Site Location

Location Description: East Fork Kuparuk River	(b) (7)(F), (b) (3)
GPS Coordinates: (b) (7)(F), (b) (3)	
Primary Access: Helicopter	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s): Containment booming and underflow dams at areas of opportunity near the pond outlet on the north end	**Winter Response Tactic(s)** Ice slotting Snow berming Containment boom or water dam in open areas
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 3-13

III. General Site Information

Water Path: The East Fork of the Kuparuk River flows into a pond area before re-collecting and exiting the north end where it joins other tr butaries to form the Kuparuk River.	**Water Variations:** The East Fork Kuparuk River is susceptible to some pond influences, as well as rain and seasonal influences.
LZ Location: On west side of pond outlet	**Forward Staging Area:** OMS 117-1

Nearest Pump Station/Response Base: PS03

Response Equipment On Site (Kits and major items): Boom, Boom Anchor Plates, Skorboom Accessories, Lumber/Plywood (Marine Grade)

Stream Bank Conditions at Site: Flat and open along most of the area There is a small knoll to one side of the outlet.	**Vegetation Conditions at Site:** Tundra with some wet, marshy areas
Location of Nearest Initial Helicopter Refueling Point: Galbraith	**Utilize Additional Response Resources from:** PS03

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

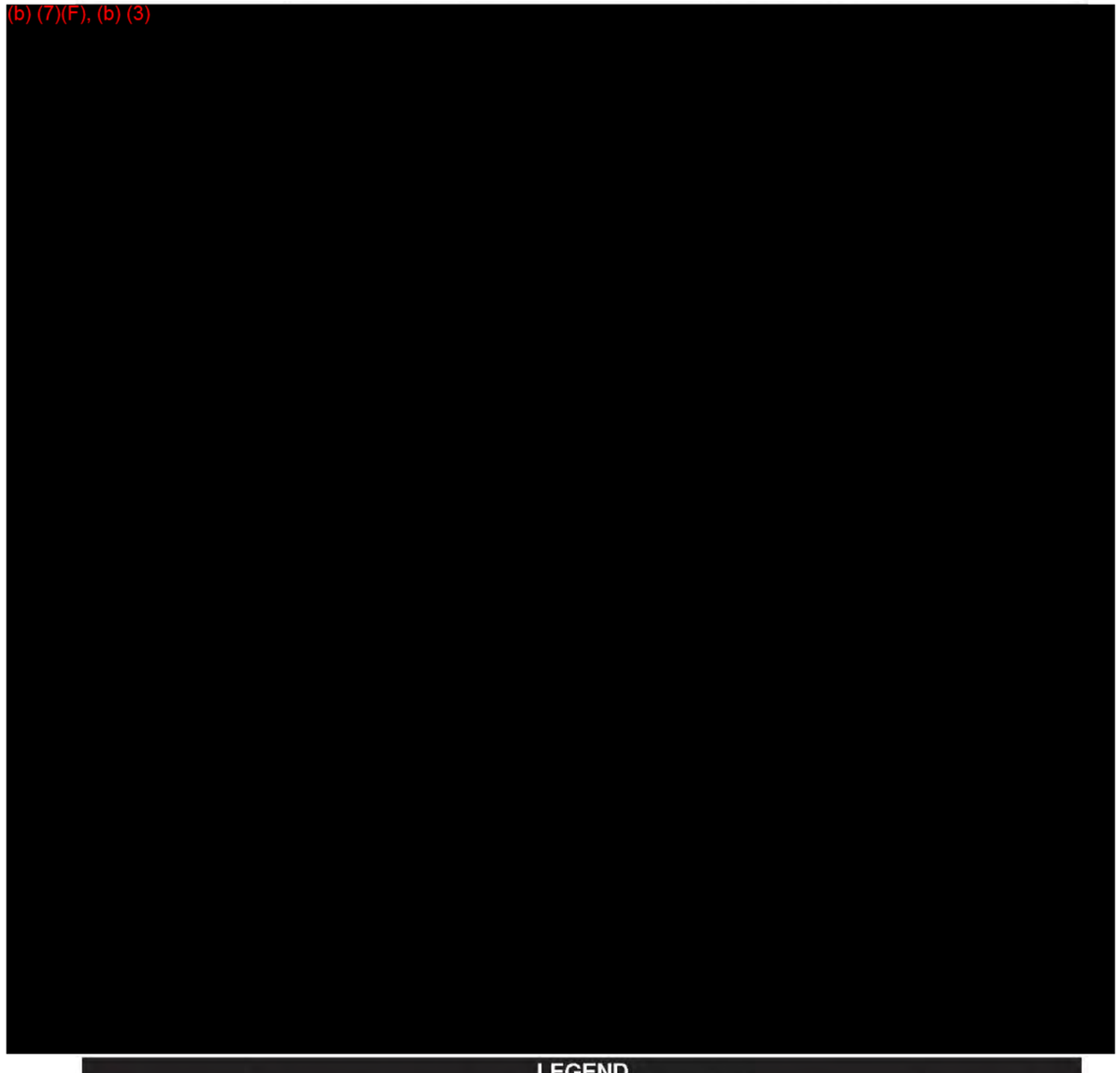
The site may be defined in high-water seasons, or almost dry in the summer.

Water rises quickly because it is the only pond outlet for this system

River Data	Staging Areas	Base Map Containment Sites	CS 3-12 Kuparuk River
• Width = 25 ft. - 100 ft. • Velocity = 1 - 6 ft./sec.	• PS 3 • OMS 117-1 • Toolik Lake Airstrip	CS 3-11 **CS 3-12** CS 3-13 CS 3-14 CS 3-15 CS 6-15A CS 3-16 CS 3-17 CS 3-18 CS 3-19	C-Plan Map Ref. 13W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Kuparuk River — CS 3-12

I. Site Location

Location Description:
Kuparuk River Crossing of the old Winter Road

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3),

Primary Access:
Helicopter

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.
Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Containment booming with potential use of water dams at low water or in channels

Winter Response Tactic(s)
Containment booming
Ice slotting
Snow berming

Additional Containment Sites Above this Location:
CS 3-14, CS 3-15, CS 3-15A, 3-16

Additional Containment Sites Below this Location:
CS 3-13

III. General Site Information

Water Path:
Kuparuk River passes under the pipeline above the site and joins other tributaries well downstream of the site.

Water Variations:
Kuparuk River is susceptible to rain and seasonal influences. The site is part of a number of small tributaries that form above the site.

LZ Location:
On southwest side of river bend

Forward Staging Area:
OMS 117-1

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
Boom, Boom Anchor Plates, Skorboom Accessories, Lumber/Plywood (Marine Grade)

Stream Bank Conditions at Site:
Flat and open
Some cut bank at higher water levels

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

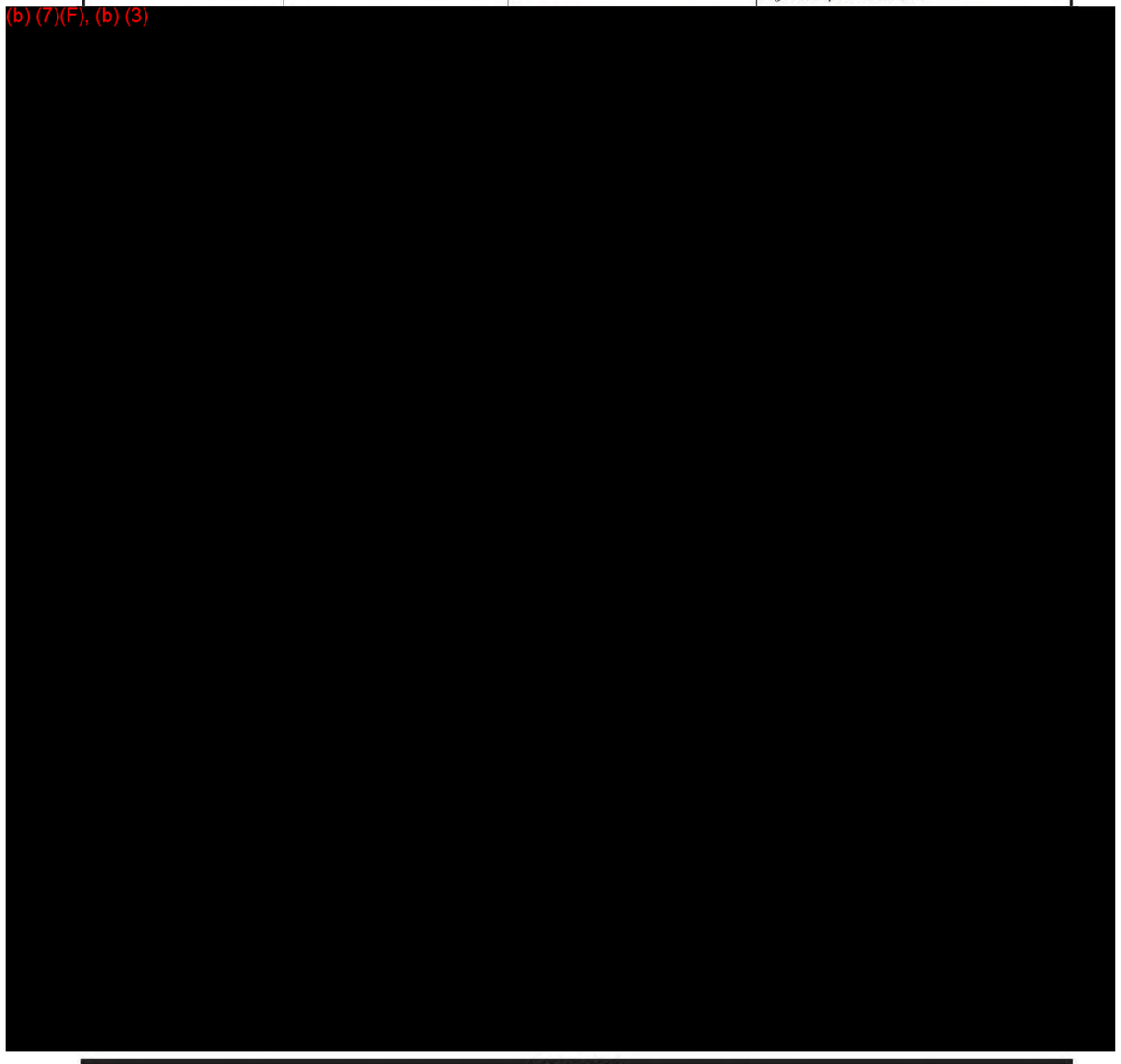
IV. General Site Description

The site is relatively small at normal water levels. Many areas of opportunity exist upstream on gravel bars, bluffs, and other locations.

River Data	Staging Areas	Base Map Containment Sites			CS 3-13 Kuparuk River
• Width = 10 - 100 ft. Multiple Channels • Velocity = 1 - 3 ft./sec.	• PS 3 & 4 • Toolik Lake Airstrip	CS 3-11 CS 3-14 CS 3-16 CS 3-19	CS 3-12 CS 3-15 CS 3-17	CS 3-13 CS 3-15A CS 3-18	C-Plan Map Ref. 12W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Kuparuk River

CS 3-13

I. Site Location

Location Description:
Kuparuk River

(b) (7)(F), (b) (3)

PS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Containment booming at areas of opportunity along the river bank

Winter Response Tactic(s)
Containment booming
Possible use of water dam at low water levels
Oil may not reach the site in winter due the distance from the pipeline (approx. 12.9 air miles).

Additional Containment Sites Above this Location:
CS 3-11, CS 3-12, CS 3-14, CS 3-15, CS 3-16, CS 3-17, CS 3-18, CS 3-19

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Several Kuparuk River tr butaries cross under the pipeline. They join and form the Kuparuk River above the site.

Water Variations:
Multiple braided channels
Low-water conditions create several bars and islands in the channels.

LZ Location:
East side of the river bank

Forward Staging Area:
OMS 117-1

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open
Some cut bank at high water areas

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagle

IV. General Site Description

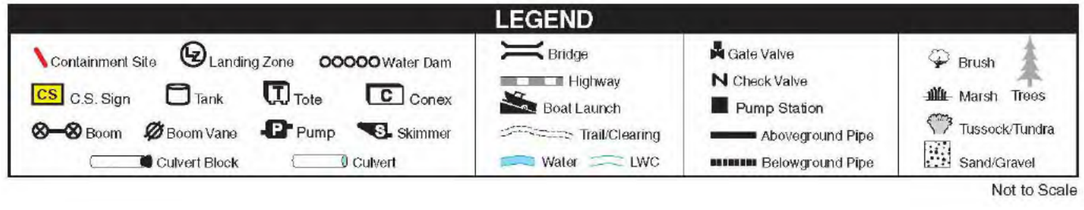
The site is in small braided channel area of the river.

Many areas of opportunity exist upstream of the site. The site is located approximately 13 air miles to the pipeline crossing.

River Data	Staging Areas	Base Map Containment Sites	CS 3-14 Kuparuk River
• Width = 10 - 100 ft. • Velocity = 1 - 3 ft./sec.	• Work Pad near PLMP 125 • 117 AMS-1	CS 3-11 CS 3-12 CS 3-13 **CS 3-14** CS 3-15 CS 3-15A CS 3-16 CS 3-17 CS 3-18 CS 3-19	C-Plan Map Ref. 13W, 14 Aerial Map Ref. 65 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Kuparuk River CS 3-14

I. Site Location

(b) (7)(F), (b) (3)

Location Description: Kuparuk River near the Dalton Hwy	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Helicopter	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Establish water dam containment at sites where oil recovery can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s): Containment booming with water dams in low channels	**Winter Response Tactic(s)** Ice slotting Snow berming Water dam
Additional Containment Sites Above this Location: CS 3-15, CS 3-15A, CS 3-16	**Additional Containment Sites Below this Location:** CS 3-14, CS 3-13

III. General Site Information

Water Path: Kuparuk River joins other tributaries well downstream of the site and is approximately 0.6 mile below the pipeline and highway.	**Water Variations:** Kuparuk River is susceptible to rain and seasonal influences. Water tends to stay in defined banks, but there are some low areas that form ponds at high water.
LZ Location: At site	**Forward Staging Area:** OMS 117-1

Nearest Pump Station/Response Base: PS03

Response Equipment On Site (Kits and major items):

Stream Bank Conditions at Site: Defined Some cut banks at high water	**Vegetation Conditions at Site:** Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS03

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

IV. General Site Description

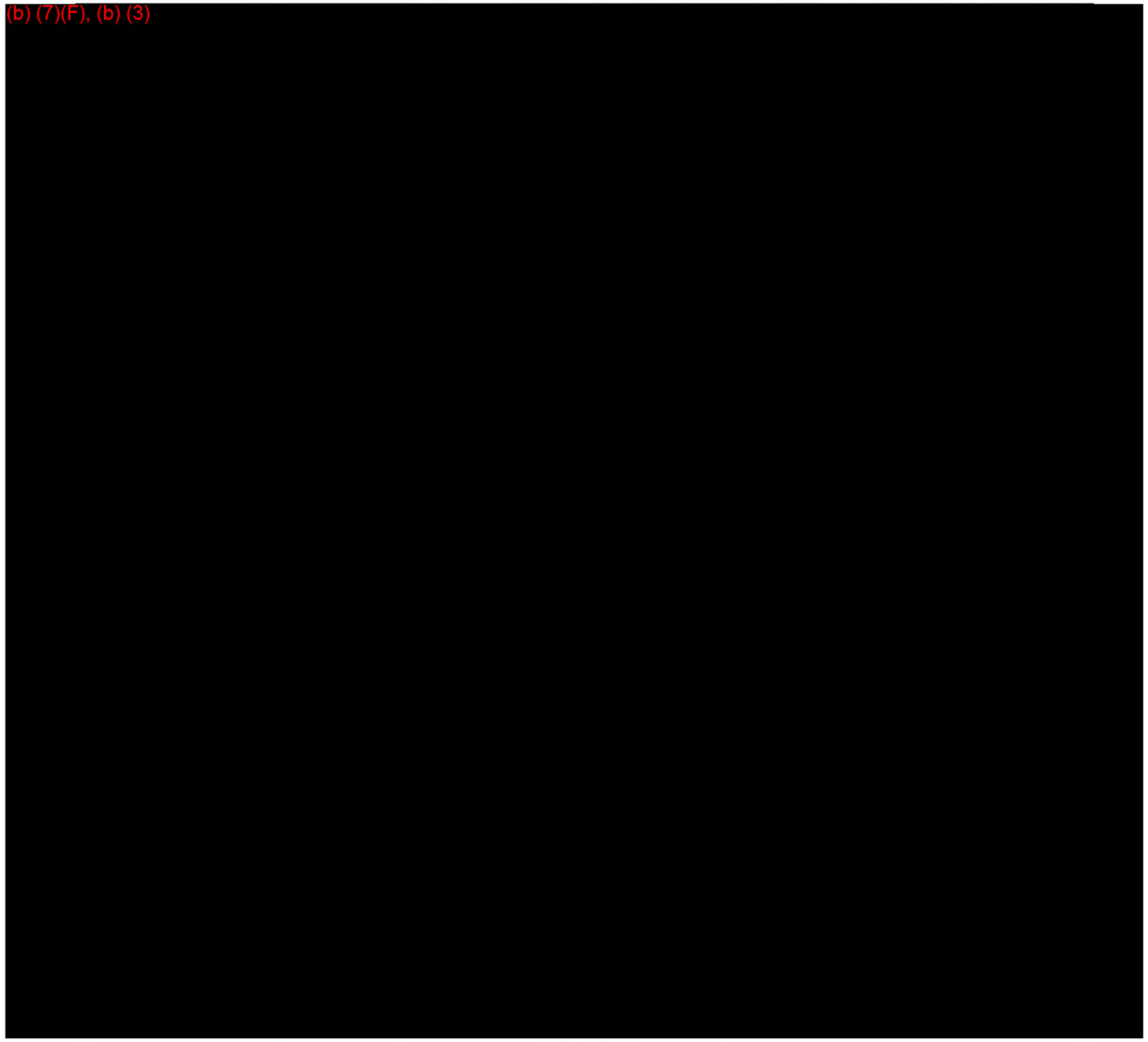
The site is within view of the highway.

Banks can be deep in high water; low water exposes numerous gravel bars.

River Data	Staging Areas	Base Map Containment Sites			CS 3-15 Becky Creek
• Width = 3 - 8 ft. • Velocity = 1 - 3 ft./sec.	• 116 APL-6 • Work Pad near PLMP 126.5	CS 3-11 CS 3-14 CS 3-16 CS 3-19	CS 3-12 **CS 3-15** CS 3-17	CS 3-13 CS 3-15A CS 3-18	C-Plan Map Ref. 13W, 14 Aerial Map Ref. 65 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Becky Creek — CS 3-15

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Becky Creek crossing of 116 APL-6 Road

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive Dalton Highway to 116 APL-6

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Utilize decanting procedures to maximize oil storage and transfer needs

Summer Response Tactic(s):
Containment booming, culvert blocking, and water dam depending on water levels

Winter Response Tactic(s)
Ice slotting
Snow berming
Containment boom in open areas

Additional Containment Sites Above this Location:
CS 3-15A

Additional Containment Sites Below this Location:
CS 3-14, CS 3-13, CS 3-12

III. General Site Information

Water Path:
Kuparuk River flows under the pipeline and to this point of Becky Creek, a short distance at the highway crossing.

Water Variations:
Becky Creek is susceptible to rain and seasonal influences.

LZ Location:
LZ on 116 APL-6

Forward Staging Area:
On APL road at conex site

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):(Annie)
1 Standard Conex, Boom

Stream Bank Conditions at Site:
Flat with access along the highway ROW

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

IV. General Site Description

The site has several areas of opportunity above and just below the highway crossing.

River Data	Staging Areas	Base Map Containment Sites	CS 3-15A Kuparuk River
• Width = 10 - 100 ft. • Velocity = 1 - 3 ft./sec.	• 116 APL-6 • Work Pad near PLMP 126.5	CS 3-11 CS 3-12 CS 3-13 CS 3-14 CS 3-15 **CS 3-15A** CS 3-16 CS 3-17 CS 3-18 CS 3-19	C-Plan Map Ref. 13W, 14 Aerial Map Ref. 65 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam	Bridge	Gate Valve	Brush; Trees
C.S. Sign; Tank; Tote; Conex	Highway	Check Valve	Marsh
Boom; Boom Vane; Pump; Skimmer	Boat Launch	Pump Station	Tussock/Tundra
Culvert Block; Culvert	Trail/Clearing	Aboveground Pipe	Sand/Gravel
	Water; LWC	Belowground Pipe	

Not to Scale

Alyeska pipeline SERVICE COMPANY

Kuparuk River CS 3-15A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Kuparuk River Crossing of the Dalton Highway	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
116 APL-6	

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming	Ice slotting Snow berming Containment boom in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 3-15	CS 3-14, CS 3-13, CS 3-12

III. General Site Information

Water Path:	Water Variations:
Kuparuk River flows under the pipeline a short distance to this point at the highway crossing.	The Kuparuk River is susceptible to rain and seasonal influences.

LZ Location:	Forward Staging Area:
LZ on 116 APL-6	On APL road at conex site

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):(Annie)
MegaSecur Dams

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat with access along the highway ROW	Tundra

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

IV. General Site Description

The site has several areas of opportunity above and just below the highway crossing.

River Data	Staging Areas	Base Map Containment Sites			CS 3-16 Becky Creek
• Width = 2 - 10 ft. • Velocity = 1 - 3 ft./sec.	• 116 APL-1 • 116 APL-6 • Work Pad near PLMP 128.7	CS 3-11 CS 3-14 **CS 3-16** CS 3-19	CS 3-12 CS 3-15 CS 3-17	CS 3-13 CS 3-15A CS 3-18	C-Plan Map Ref. 14 Aerial Map Ref. 66 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3) (A)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Becky Creek CS 3-16

(b) (7)(F), (b) (3)

[redacted]

I. Site Location

Location Description:	GPS Coordinates:
Pipeline crossing of Becky Creek	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive Dalton Highway to 116 APL-6 to ROW	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment boom and water dam depending on water levels	Ice slotting Snow berming Containment boom and water dam depending on water levels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 3-15, CS 3-15A, CS 3-14, CS 3-13, CS 3-12

III. General Site Information

Water Path:	Water Variations:
Becky Creek flows out of Becky Lake, across the pipeline, access road, and into the Kuparuk River near CS 3-15.	Becky Creek is susceptible to lake, rain, and seasonal influences.

LZ Location:	Forward Staging Area:
On north side of pipeline or areas of opportunity	On ROW

Nearest Pump Station/Response Base:

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
On ROW, banks accessible and open	Tundra

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS03

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

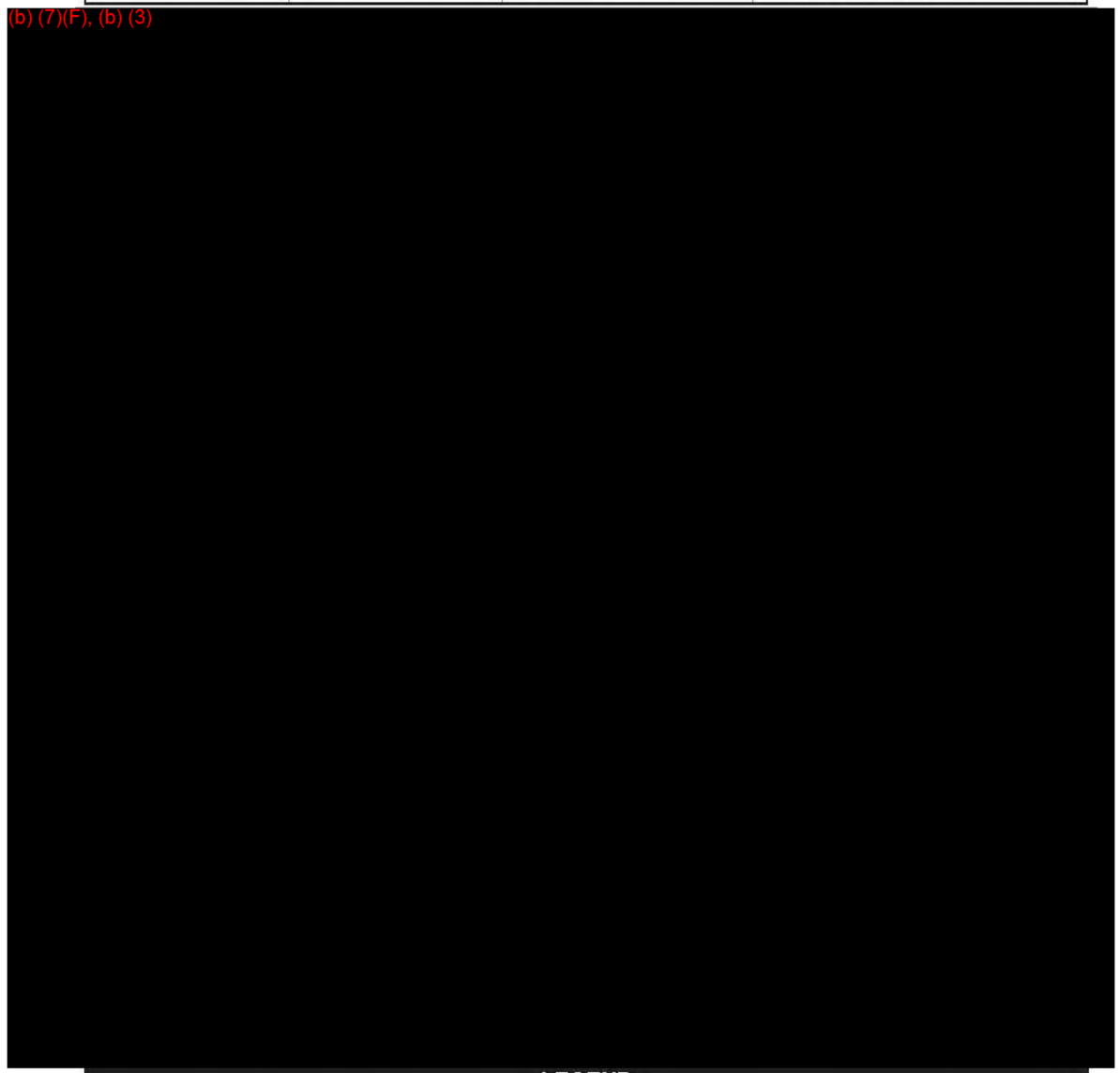
IV. General Site Description

The site is at drivable LWC on the ROW.

River Data	Staging Areas	Base Map Containment Sites			CS 3-17 South Inlet Toolik Lake
• Width = 10 - 50 ft. Multiple Channels • Velocity = 1 - 3 ft./sec.	• 116 APL-1 • Toolik Lake Access Road • PS 4	CS 3-11 CS 3-14 CS 3-16 CS 3-19	CS 3-12 CS 3-15 **CS 3-17** CS 3-18	CS 3-13 CS 6-15A	C-Plan Map Ref. 14 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AK SO Lands Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

South Inlet Toolik Lake — CS 3-17

I. Site Location

Location Description:
South Inlet of Toolik Lake

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Containment booming and water dam at entrance to pond area

Winter Response Tactic(s)
Ice slotting
Water dam in open areas

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 3-18, CS 3-19

III. General Site Information

Water Path:
One of a few drainages that form ponds as they enter Toolik Lake

Water Variations:
The South Inlet of Toolik Lake is susceptible to lake influences.

LZ Location:
At site

Forward Staging Area:
Toolik Lake access road

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open
Low hill to the east side of the inlet

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03, PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, fox, bear, eagle

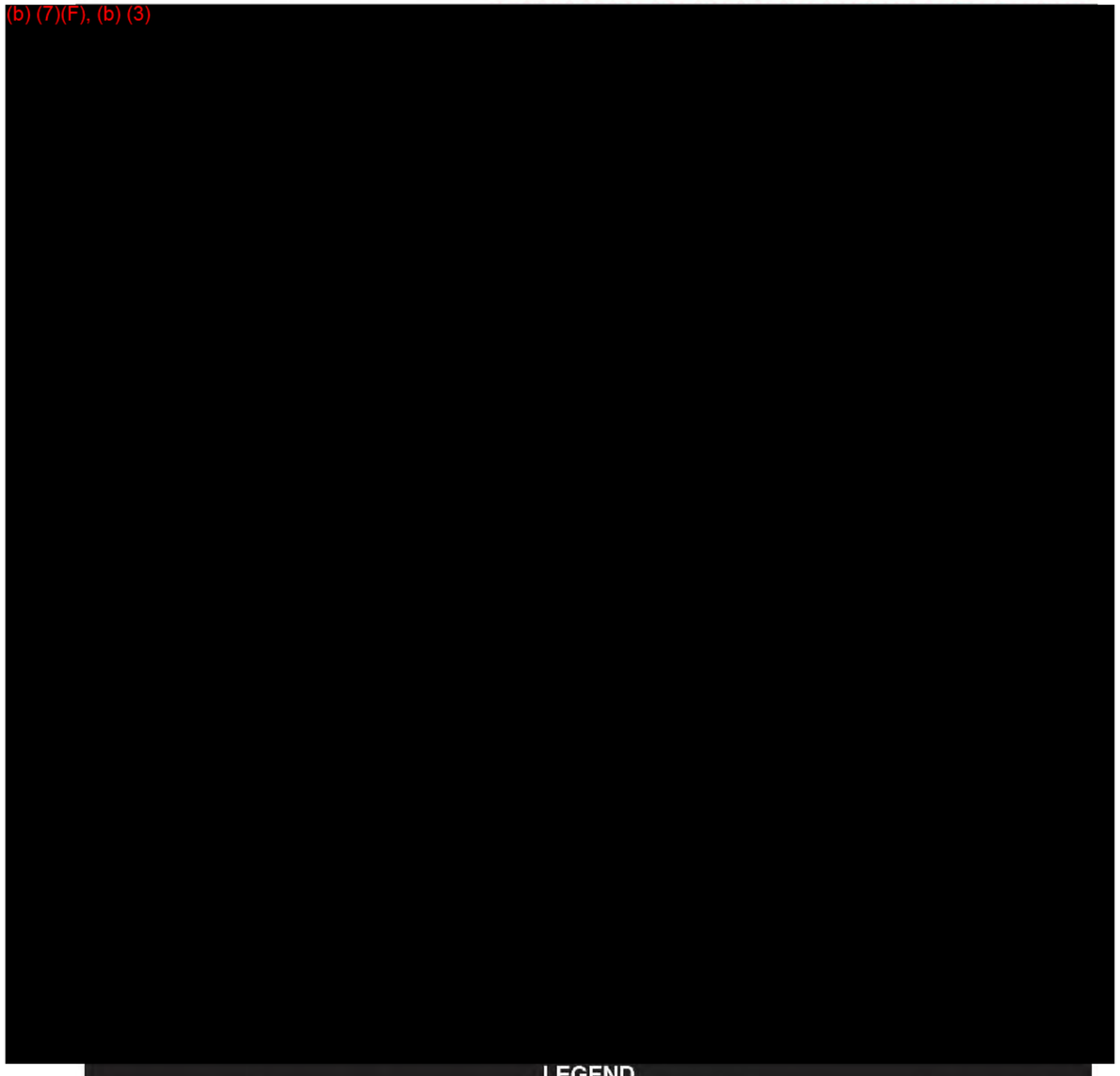
IV. General Site Description

The site has several areas of opportunity upstream on gravel bars and creek bends.

River Data	Staging Areas	Base Map Containment Sites			CS 3-18 Toolik Lake
• Width = 10 - 30 ft. • Velocity = 1 - 3 ft./sec.	• 116 APL-1 • Toolik Lake Camp • PS 4	CS 3-11 CS 3-14 CS 3-16 CS 3-19	CS 3-12 CS 3-15 CS 3-17	CS 3-13 CS 6-15A CS 3-18	C-Plan Map Ref. 14 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Toolik Lake — CS 3-18

(b) (3), (b) (7)(F)

I. Site Location

Location Description:
Entrance of Toolik River to Toolik Lake

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Drive to Tool k Lake Camp

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Containment booming and water dam at areas along river entrance

Winter Response Tactic(s)
Ice slotting
Containment booming

Additional Containment Sites Above this Location:
CS 3-17

Additional Containment Sites Below this Location:
CS 3-19

III. General Site Information

Water Path:
The Toolik River enters Toolik Lake at the site and exits the lake into the Kuparuk River tributary.

Water Variations:
Toolik Lake is susceptible to lake influences.

LZ Location:
LZ on the point near the site or at Toolik Lake Camp

Forward Staging Area:
Toolik Lake Camp

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open with some cut bank against lake shore

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS03, PS04

Communications Resources Available:
VHF, ARTS, satellite phone.

Wildlife Sensitivities: Car bou, fox, eagle, bear

IV. General Site Description

The site has many areas to establish containment upstream.

Toolik Lake Camp is a short walk from site.

River Data	Staging Areas	Base Map Containment Sites			CS 3-19 Kuparuk R. Tributary
• Width = Lake Outlet to 100' • Velocity = 0 - 2 ft./sec.	• Toolik Lake Camp • PS 4 • Toolik Lake Airstrip	CS 3-11 CS 3-14 CS 3-16 **CS 3-19**	CS 3-12 CS 3-15 CS 3-17	CS 3-13 CS 3-15A CS 3-18	C-Plan Map Ref. 14 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh / Trees
Water Dam	Boat Launch	Pump Station	Tussock/Tundra
C.S. Sign	Trail/Clearing	Aboveground Pipe	Sand/Gravel
Tank	Water / LWC	Belowground Pipe	
Tote			
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Kuparuk River Tributary — CS 3-19

I. Site Location

(b) (7)(F), (b) (3)

Location Description: Outlet of Toolik Lake	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Helicopter	**Secondary Access:** Helicopter; may be able to walk in from Toolik Lake Camp

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s): Containment and deflection booming on the lake outlet.	**Winter Response Tactic(s)** Ice slotting Containment booming and water dam in open areas
Additional Containment Sites Above this Location: CS 3-17, CS 3-18	**Additional Containment Sites Below this Location:** CS 3-13

III. General Site Information

Water Path: Toolik Lake enters the Kuparuk River Tributary at this site.	**Water Variations:** Toolik Lake is susceptible to lake influences.
LZ Location: At site	**Forward Staging Area:** Toolik Lake Camp

Nearest Pump Station/Response Base: PS03

Response Equipment On Site (Kits and major items): 1 Standard Conex, Boom

Stream Bank Conditions at Site: Level and stable May vary due to water level	**Vegetation Conditions at Site:** Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS03

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, fox, bear

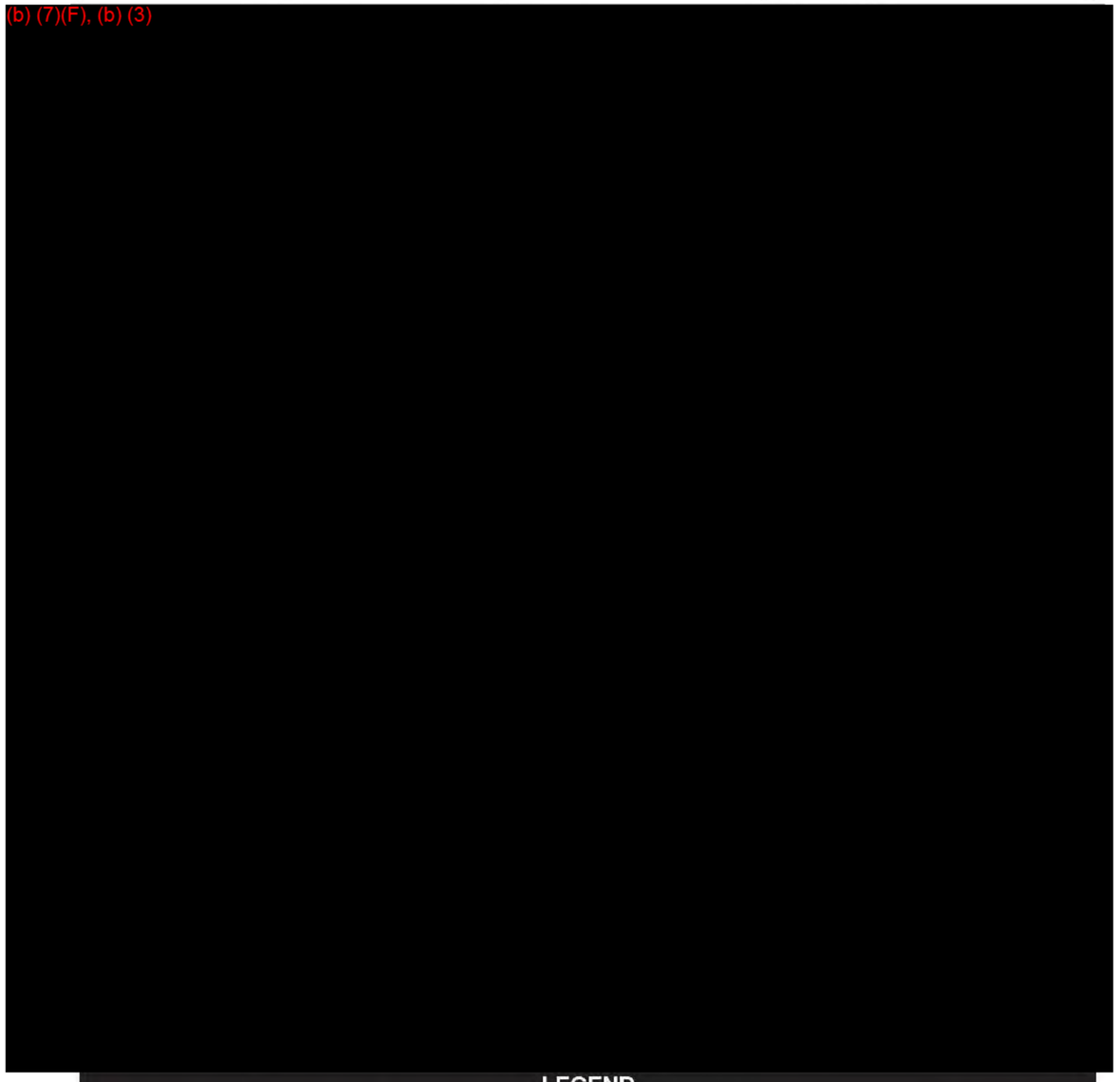
IV. General Site Description

The site is close to the Tool k Lake Camp and access roads. Many areas for additional containment sites are just downstream on the Kuparuk River Tributary.

River Data	Staging Areas	Base Map Containment Sites	CS 3-20 Jill Creek
• Width = 1 - 20 ft. • Velocity = 1 - 3 ft./sec.	• 115 APL-3 • PS 4	CS 3-20 CS 3-21 CS 3-25	C-Plan Map Ref. 14 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Jill Creek CS 3-20

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	PS Coordinates:
Jill Creek	(b) (7)(F), (b) (3)
Primary Access: Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming and water dam depending on water levels and areas of opportunity	Ice slotting Snow berming Containment boom in open areas
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 3-21

III. General Site Information

Water Path:	Water Variations:
Jill Creek flows under the pipeline and into a small pond at the site. The pipeline is approximately 2 miles from this site.	Jill Creek is susceptible to lake influences and may be flowing or nearly dry depending on the season.
LZ Location: At site on east side of Jill Creek	**Forward Staging Area:** 115 APL-3

Nearest Pump Station/Response Base: PS03

Response Equipment On Site (Kits and major items): None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open Small hill on west side of inlet	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS03, PS04

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, fox, bear

IV. General Site Description

There is a small creek-like entrance to the pond. Areas of opportunity are present upstream.

River Data	Staging Areas	Base Map Containment Sites	CS 3-21 Lake Outlet, Jill Creek
• Width = 5 - 20 ft. • Velocity = 0 - 2 ft./sec.	• PS 4 • Work Pad PLMP 279	CS 3-20 **CS 3-21** CS 3-25	C-Plan Map Ref. 14 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Lake Outlet, Jill Creek — CS 3-21

I. Site Location

(b) (7)(F), (b) (3) [redacted]

Location Description:	GPS Coordinates:
Lake outlet of Jill Creek	(b) (7)(F), (b) (3) [redacted]
Primary Access: Helicopter	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming and water dam depending on water levels	Ice slotting Containment booming and water dam depending on open areas
Additional Containment Sites Above this Location: CS 3-20	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
Jill Creek passes under the pipeline, through a small pond, and into the lake outlet.	Jill Creek is susceptible to lake influences.
LZ Location: At site Low bluff on one side of creek outlet	**Forward Staging Area:** 115 APL-3

Nearest Pump Station/Response Base:
PS03

Response Equipment On Site (Kits and major items):(Annie)
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open Bluff on one side of outlet	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS03, PS04

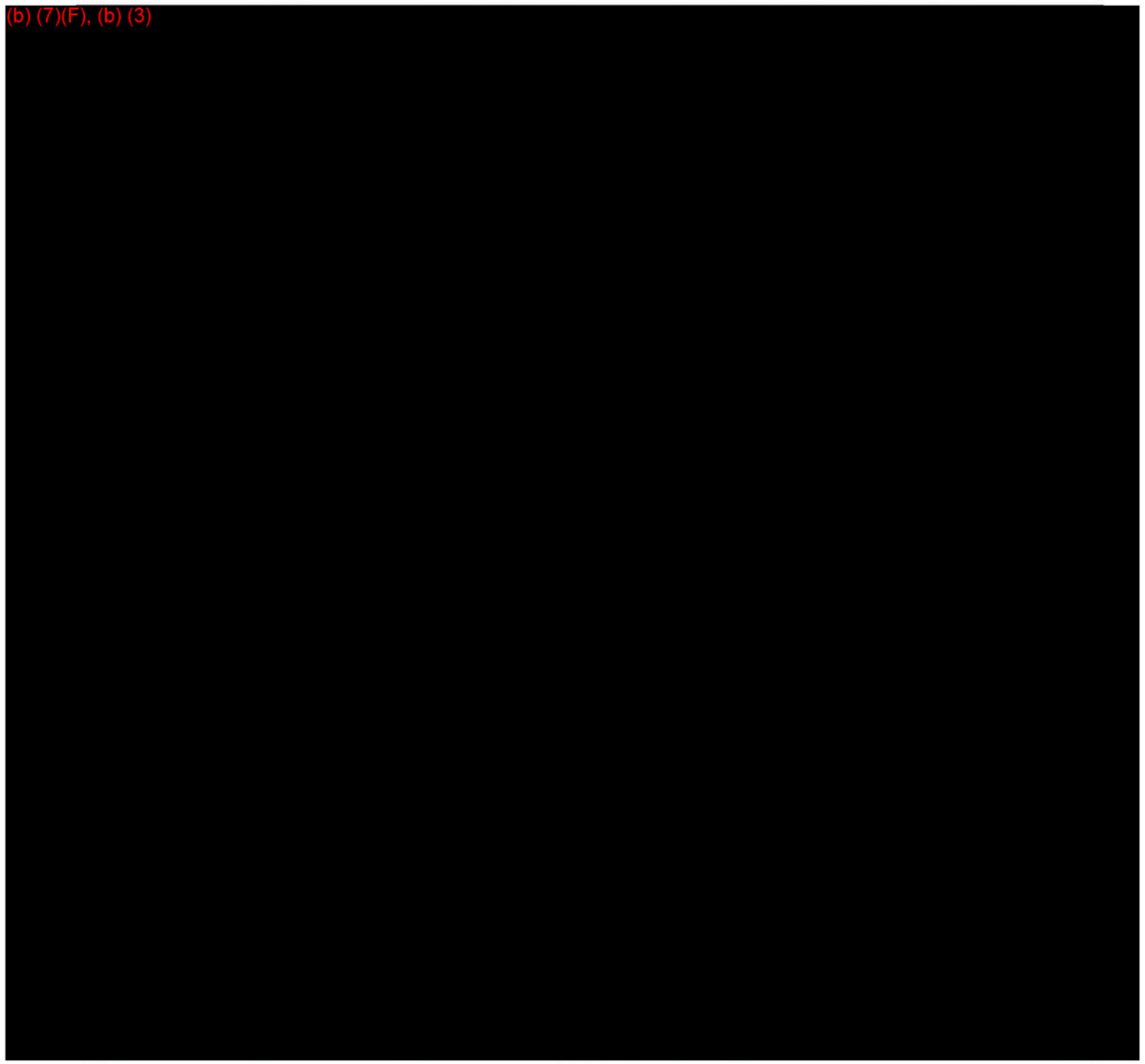
Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 3-22 Galbraith Lake Slough
• Width = 20 - 100 ft. • Velocity = 0 - 2 ft./sec.	• PS 4 • OMS 114-2	CS 3-22 CS 3-26 CS 3-29	CS 3-24 CS 3-27 CS 3-30	CS 3-25 CS 3-28 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. 72 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Galbraith Lake Slough — CS 3-22

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Galbraith Lake Slough

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Containment booming

Winter Response Tactic(s)
Ice slotting
Containment booming

Additional Containment Sites Above this Location:
CS 3-26, CS 3-25, CS 3-27, CS 3-24

Additional Containment Sites Below this Location:
CS 3-31, CS 3-30

III. General Site Information

Water Path:
Galbraith Lake and adjoining drainages run parallel to the pipeline above the site. The slough meanders into the Atigun River below the site.

Water Variations:
Galbraith Lake Slough is susceptible to lake influences.

LZ Location:
At site on west side of slough

Forward Staging Area:
Galbraith Airport

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex located at CS 3-29, Boom

Stream Bank Conditions at Site:
Flat and open

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

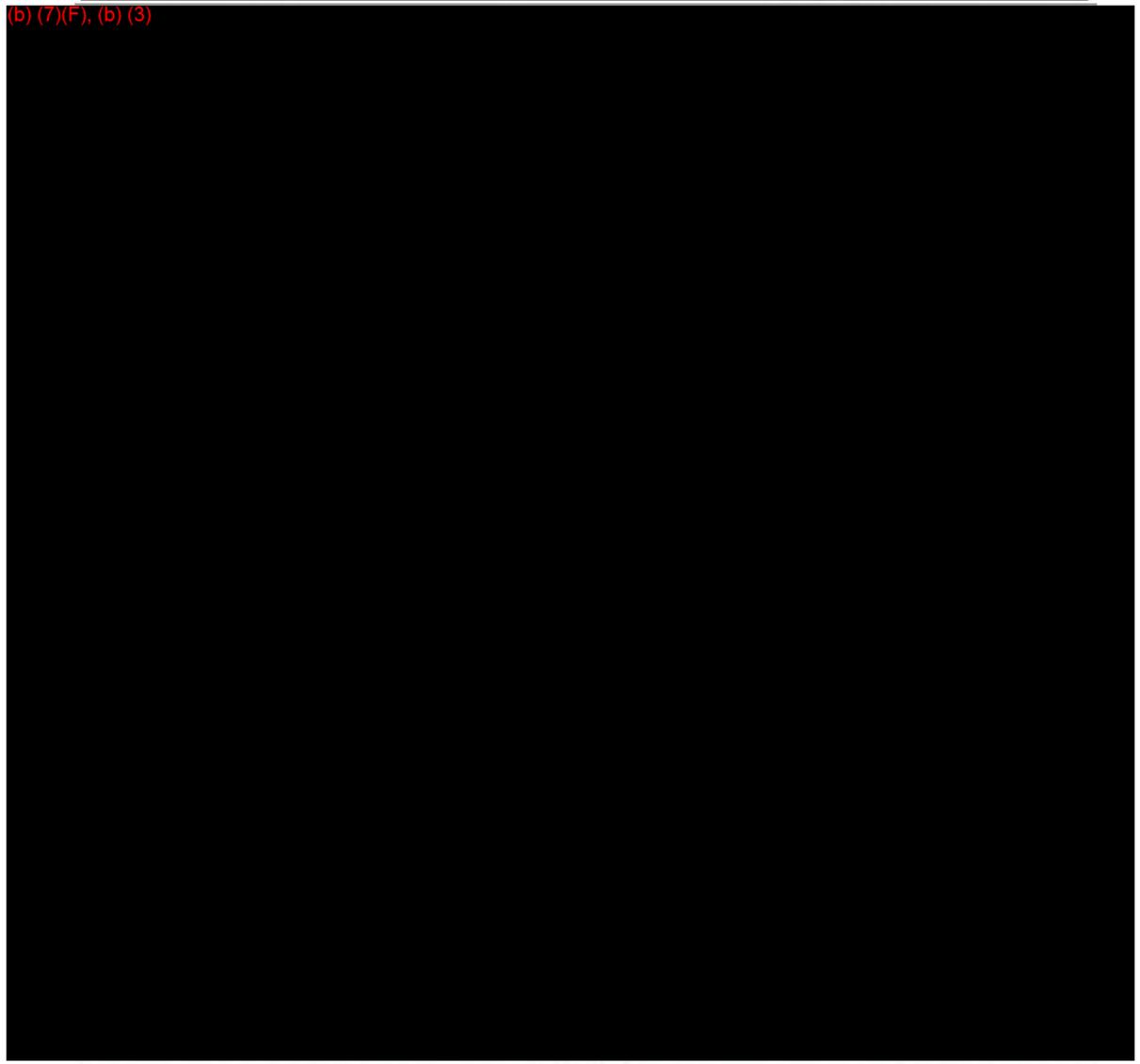
Wildlife Sensitivities: Car bou, fox, bear

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 3-23 Atigun River
• Width = 10 - 100 ft. Braided Channels • Velocity = 1 - 4 ft./sec.	• PS 4	CS 3-22 CS 3-23 CS 3-28 CS 3-29	C-Plan Map Ref. 14E, 15E Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Not to Scale

Alyeska pipeline SERVICE COMPANY

Atigun River

CS 3-23

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Atigun River	(b) (7)(F), (b) (3)

Primary Access:	
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming	Ice slotting Deflection and containment booming Oil may not reach the site due to its distance from the pipeline.

Additional Containment Sites Affected Above this Location:	Additional Containment Sites Below this Location:
CS 3-22, CS 3-29, CS 3-28. Other sites are some distance upstream from these sites.	None

III. General Site Information

Water Path:	Water Variations:
Atigun River flows through the Atigun River Gorge at this area.	Atigun River is suscept ble to rain and seasonal influences. Many streams enter above the site and do not cross the pipeline.

LZ Location:	Forward Staging Area:
At site	Work pad near PLMP 143

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat	Tundra

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagle

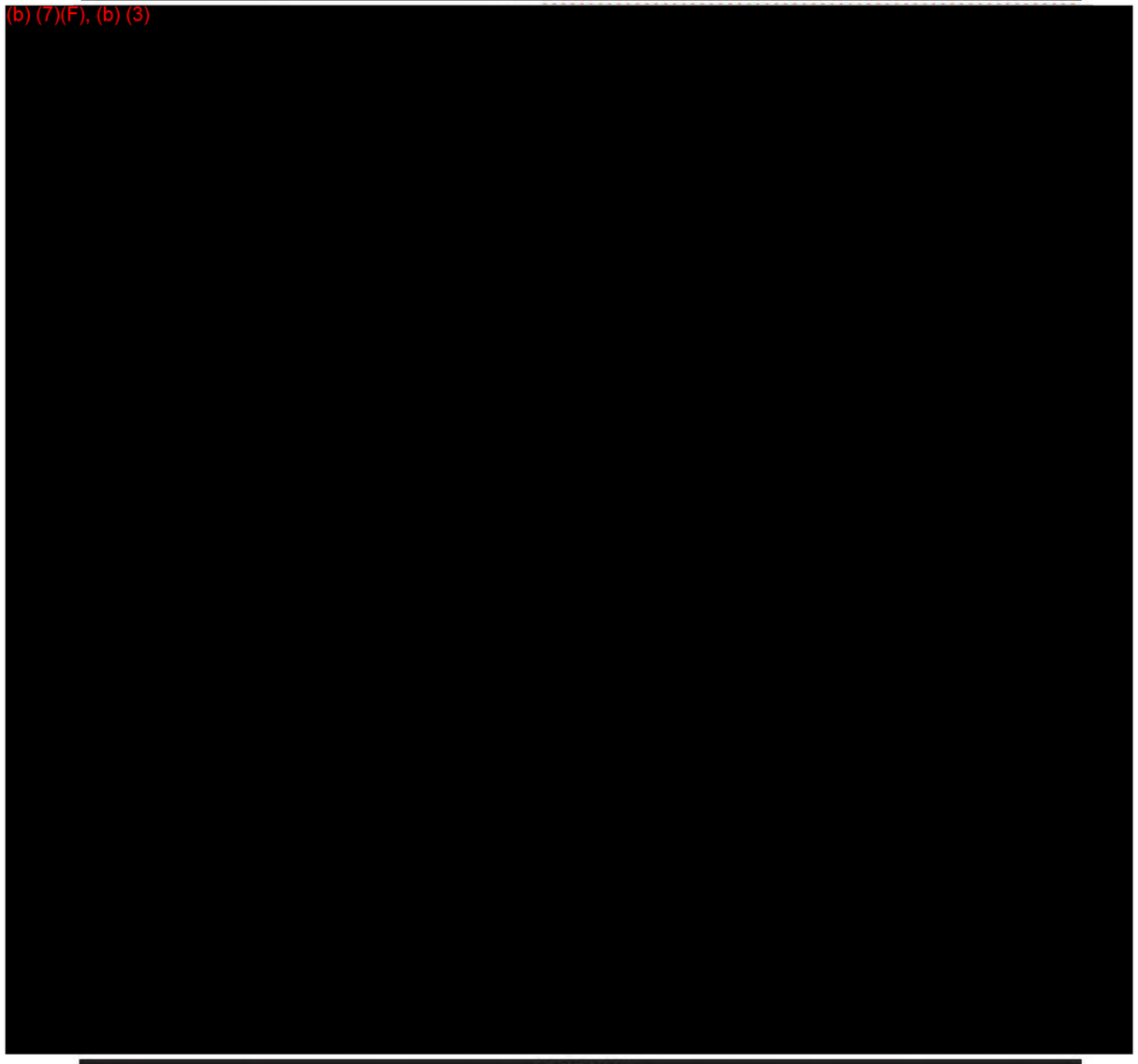
IV. General Site Description

The site is several miles downstream of pipe crossing and in an open plain. The Atigun River has several channels and gravel bars at normal water levels.

A site of opportunity is located upstream all the way to the pipeline.

River Data	Staging Areas	Base Map Containment Sites	CS 3-24 Galbraith Lake Inlet
• Width = 20 - 50 ft. • Velocity = 1 - 3 ft./sec.	• Galbraith Airport • PS 4	CS 3-22 **CS 3-24** CS 3-25 CS 3-26 CS 3-27 CS 3-28 CS 3-29 CS 3-30 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. 71 (b) (7)(F), (b) (3) [redacted] ted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline

Galbraith Lake Inlet — CS 3-24

I. Site Location

Location Description:		GPS Coordinates:
Between Galbraith Airport and the pipeline	(b) (7)(F), (b) (3) [redacted]	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	Helicopter; may be able to boat to site at higher water levels

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming and water dams based upon water level	Ice slotting Snow berming Containment booming in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 3-27, CS 3-25	CS 3-22

III. General Site Information

Water Path:	Water Variations:
Water flows toward Galbraith Lake.	Water level is influenced by Ga braith Lake.

LZ Location:	Forward Staging Area:
On east side of lake inlet	Galbraith Airport

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open	Tundra

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS04

Communications Resources Available:
VHF, ARTS, satellite phone

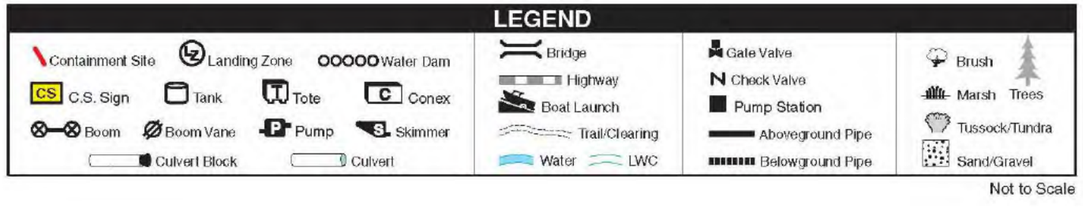
Wildlife Sensitivities: Car bou, bear, fox, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 3-25 Island Lake Outlet
• Width = 3 - 40 ft. • Velocity = 0 - 3 ft./sec.	• PS 4 • 115 APL-1	CS 3-22 CS 3-26 CS 3-29	CS 3-24 CS 3-27 CS 3-30	CS 3-25 CS 3-28 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. 70 (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Island Lake Outlet CS 3-25

I. Site Location

Location Description:	(b) (7)(F), (b) (3)	GPS Coordinates:
Outlet of Island Lake		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter; may be able to walk in from highway

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming and water dam depending on water levels	Ice slotting Containment boom and water dams in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 3-26

III. General Site Information

Water Path:	Water Variations:
Unnamed Creek is the outlet of Island Lake, and it eventually flows into Galbraith Lake.	Water level is influenced by Ga braith Lake.

LZ Location:	Forward Staging Area:
At site	115 APL-1

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open areas	Tundra

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS04

Communications Resources Available:
VHF, ARTS, satellite phone

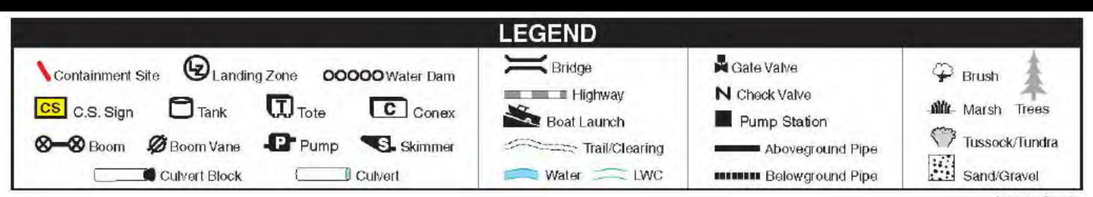
Wildlife Sensitivities: Car bou, bear, fox, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 3-26 Galbraith Tributary
• Width = 20 ft. - 40 ft. • Velocity = 1 - 3 ft./sec.	• PS 4 • Galbraith Airport	CS 3-22 **CS 3-26** CS 3-29	CS 3-24 CS 3-27 CS 3-30	CS 3-25 CS 3-28 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Galbraith Tributary — CS 3-26

I. Site Location

Location Description:		GPS Coordinates:
Tributary crossing of Ga braith Airport Road	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)
Primary Access: Drive		Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Establish culvert block containment to maximize recovery options.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Deploy culvert block and containment booming at road crossing to contain oil above the site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Culvert Blocking and containment booming at areas of opportunity nearby	Culvert block
Additional Containment Sites Above this Location: CS 3-25	**Additional Containment Sites Below this Location:** CS 3-24, CS 3-27, CS 3-22, CS 3-29

III. General Site Information

Water Path:	Water Variations:
Galbraith Tr butary flows into Galbraith Lake below this site.	The tributary is susceptible by seasonal and rain influences. Culverts will largely fill at high water.
LZ Location: At site on west side of tributary	**Forward Staging Area:** Galbraith Airport Road.

Nearest Pump Station/Response Base: PS04

Response Equipment On Site (Kits and major items): Culvert Block Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable with some cut bank at high water mark; easy access at road crossing	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 3-27 Dillon's Run
• Width = 2 - 8 ft. • Velocity = 0 - 1 ft./sec.	• PS 4 • Galbraith Airport • 114 APL-2	CS 3-22 CS 3-24 CS 3-25 CS 3-26 **CS 3-27** CS 3-28 CS 3-29 CS 3-30 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. 71 (b) (7)(F), (b) (3) Consult AFSC Land legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dillon's Run CS 3-27

(b) (7)(F), (b) (3)

I. Site Location

Location Description:	S Coordinates:
Dillon's Run above Galbraith Lake	(b) (7)(F), (b) (3)
Primary Access: Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water Dam and containment booming	Ice slotting and containment booming; possible use of water dam at low water or open areas
Additional Containment Sites Affected Above this Location: CS 3-26, CS 3-25	**Additional Containment Sites Below this Location:** CS 3-24, CS 3-22, CS 3-29

III. General Site Information

Water Path:	Water Variations:
Dillon's Run enters a pond area and shortly after enters Galbraith Lake.	Dillon's Run is suscept ble to influences from Galbraith Lake.
LZ Location: At the site on west side of creek	**Forward Staging Area:** Galbraith Airport

Nearest Pump Station/Response Base: PS04

Response Equipment On Site (Kits and major items): None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

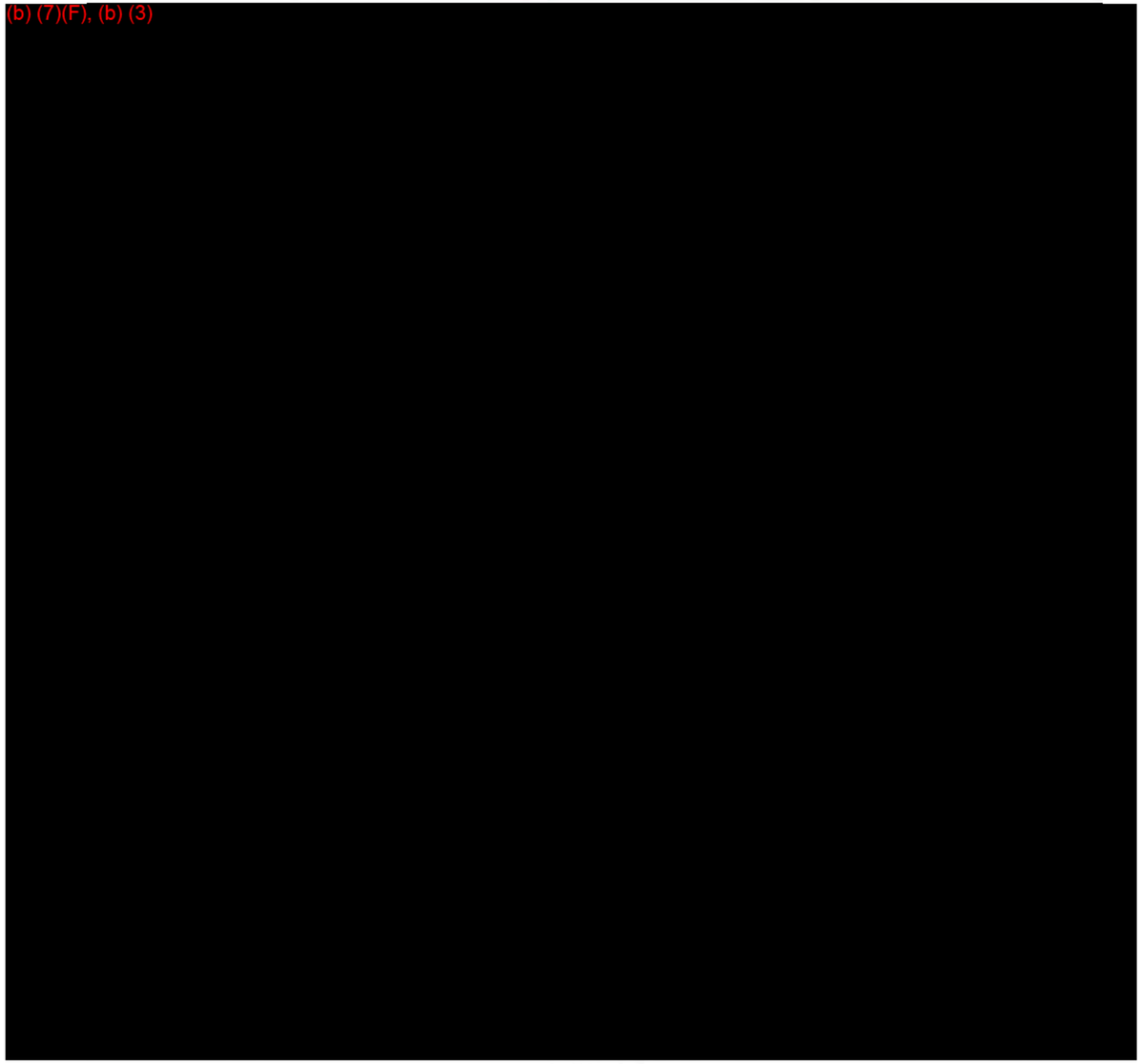
IV. General Site Description

Numerous areas of opportunity exist in the upper end of Dillon's Run.

There is an additional channel into the pond upstream of the site, but it is often dry. Blocking may be required to divert oil to this channel.

River Data	Staging Areas	Base Map Containment Sites	CS 3-28 Unnamed Creek
• Width = 10 - 30 ft. • Velocity = 1 - 3 ft./sec.	• Galbraith Airport • PS 4 • 114 APL-3	CS 3-22 CS 3-24 CS 3-25 CS 3-26 CS 3-27 **CS 3-28** CS 3-29 CS 3-30 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. 73 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh Trees
Water Dam	Boat Launch	Pump Station	Tussock/Tundra
C.S. Sign	Trail/Clearing	Aboveground Pipe	Sand/Gravel
Tank	Water LWC	Belowground Pipe	
Tote			
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 3-28

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Small drainage into Ga braith Lake	(b) (7)(F), (b) (3)
Primary Access: Helicopter	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming and water dam	Does not appear to flow in winter
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 3-29

III. General Site Information

Water Path:	Water Variations:
The unnamed drainage drains into the Galbraith Lake Slough.	The unnamed drainage is susceptible to influences from Galbraith Lake.
LZ Location: At site	**Forward Staging Area:** Galbraith Airport

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items)
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: caribou, fox, bear

IV. General Site Description

The site is a short drainage that exits a pond and flows into the Galbraith Lake Slough.

River Data	Staging Areas	Base Map Containment Sites			CS 3-29 Atigun River
• Width = 100 - 200 ft. Multiple Channels • Velocity = 1 - 4 ft./sec/	• PS 4 • Galbraith Lake Camp • 114 APL-3 & 2B	CS 3-22	CS 3-24	CS3-25	C-Plan Map Ref. 15 Aerial Map Ref. 73 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.
		CS 3-26	CS 3-27	CS 3-28	
		CS 3-29	CS 3-30	CS 3-31	North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Atigun River

CS 3-29

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Atigun River near Dalton Highway bridge	(b) (7)(F), (b) (3)
Primary Access: Drive on Dalton Highway	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection booming	Ice slotting Deflection booming in open areas
Additional Containment Sites Affected Above this Location: CS 3-31, CS 3-30, CS 3-22, CS 3-28, CS 3-24, CS 3-27, CS 3-26, CS 3-25	**Additional Containment Sites Below this Location:** None in the nearby area

III. General Site Information

Water Path:	Water Variations:
Atigun River flows under the pipeline just downstream of this site. The purpose of this site is to secure area above the pipeline.	Atigun River is suscept ble to influences from Galbraith Lake.
LZ Location: At site	**Forward Staging Area:** On (b) (7)(F), (b) (3) or at public boat launch on highway

Nearest Pump Station/Response Base: PS04

Response Equipment On Site (Kits and major items): 1 Standard Conex, 1 Auxiliary Conex (for CS 3-22), Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open; large bank and support area	Tundra with small brush
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

This site is covered with open bars and areas of opportunity. Portable pipeline may be needed for sites located away from the road access.

River Data	Staging Areas	Base Map Containment Sites			CS 3-30 Dwyer's Diddy Creek
• Width = 4 - 10 ft. • Velocity = 0 - 3 ft./sec.	• PS 4 • 114 APL-2B	CS 3-22	CS 3-24	CS3-25	C-Plan Map Ref. 15 Aerial Map Ref. 73 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site.
		CS 3-26	CS 3-27	CS 3-28	
		CS 3-29	**CS 3-30**	CS 3-31	

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dwyer's Diddy Creek — CS 3-30

I. Site Location

Location Description:
Dwyer's Diddy Creek Crossing of the Dalton Hwy

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

Primary Access:
Drive on Dalton Highway

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Culvert blocking and containment boom

Winter Response Tactic(s)
Culvert block
Snow berming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 3-29

III. General Site Information

Water Path:
The creek flows under the pipeline and under the highway before flowing into Atigun River.

Water Variations:
The creek has very low flow and is susceptible to seasonal and rain influences.
Seasonal and rain influenced

LZ Location:
East of the highway at the stream crossing

Forward Staging Area:
On work pad near creek crossing

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
PS04

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

The creek crossing has a 48-inch culvert with low flow at normal water levels.

River Data	Staging Areas	Base Map Containment Sites			CS 3-31 Unnamed Creek/Atigun River
• Width = 3 - 10 ft. • Velocity = 0 - 3 ft./sec.	• PS 4	CS 3-22 CS 3-26 CS 3-29	CS 3-24 CS 3-27 CS 3-30	CS 3-25 CS 3-28 CS 3-31	C-Plan Map Ref. 15 Aerial Map Ref. 74 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 3-31

I. Site Location

Location Description:
Small drainage into Atigun River from a pond

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish containment booming operations at sites of opportunity near the containment site.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Containment booming and water dam

Winter Response Tactic(s)
Ice slotting
Containment booming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 3-29

III. General Site Information

Water Path:
The drainage flows into the Atigun River just below PS04.

Water Variations:
The small drainage is rain influenced. There may be some backflow from the Atigun River at high water levels.

LZ Location:
At site

Forward Staging Area:
PS04

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
Boom Anchor Plates, Sandbag Kit, Underflow Dam Kit

Stream Bank Conditions at Site:

Vegetation Conditions at Site:

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

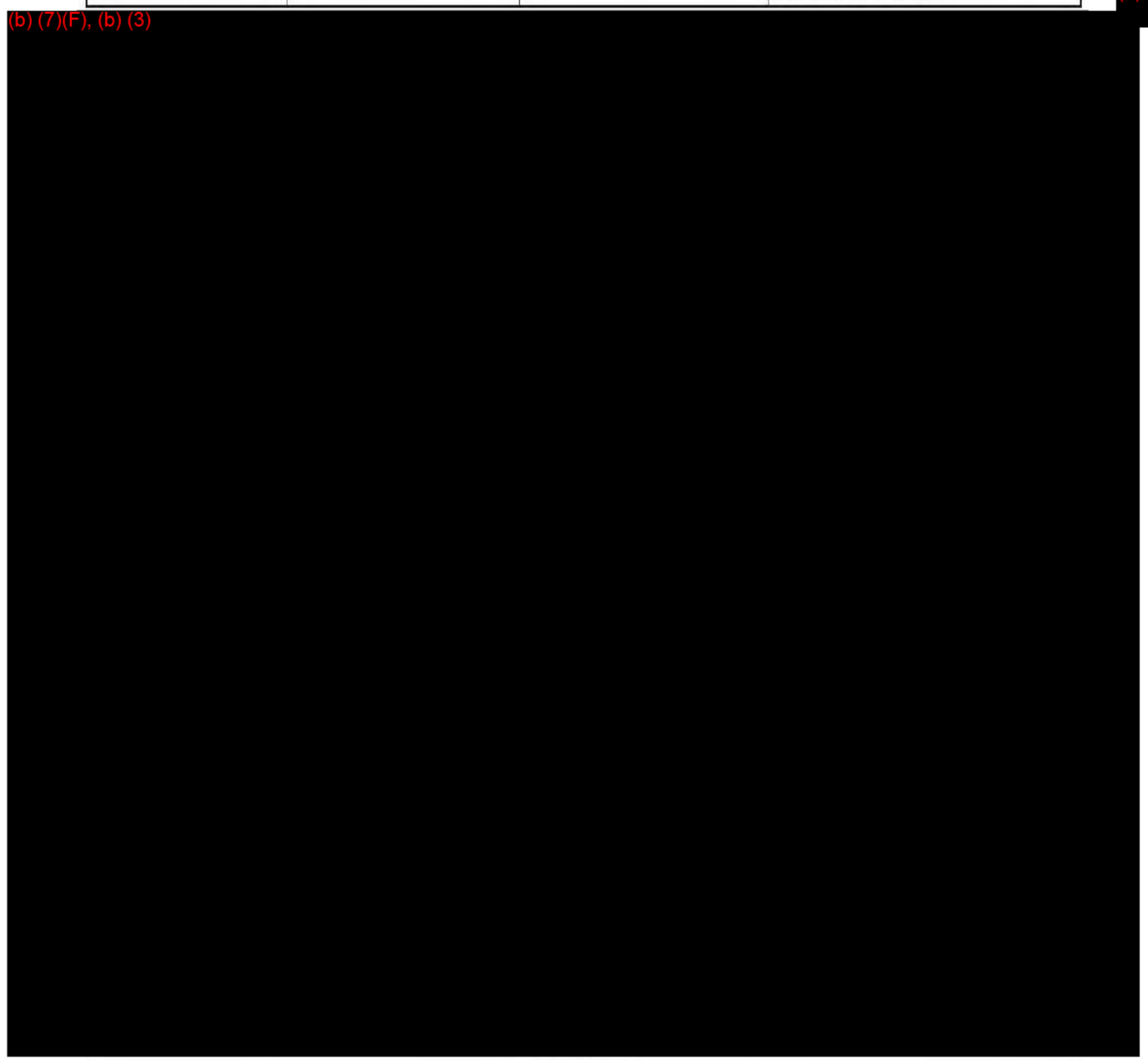
Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

The site is just below PS04 near the well site for the station.

River Data	Staging Areas	Base Map Containment Sites			CS 3-32 Atigun River
• Width = 50 - 200 ft. Multiple Channels • Velocity = 1 - 4 ft./sec.	• 113 APL-2A • 113 APL/AMS-2A	**CS 3-32** CS 4-0	CS 3-33 CS 4-1	CS 3-34 CS 4-1A	C-Plan Map Ref. 16 Aerial Map Ref. 76 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Atigun River — CS 3-32

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:	
Drive	Helicopter, may be able to wa k into site from ROW

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection booming	Deflection booming Ice slotting
Additional Containment Sites Above this Location: CS 3-33, CS 3-34	**Additional Containment Sites Below this Location:** None in the nearby area; CS 3-29 well downstream

III. General Site Information

Water Path:	Water Variations:
Atigun River flows along the pipeline corridor in this area.	Antigun River acts as a drainage system for many creeks and drainages that may cross the pipeline.
LZ Location: Near site or on ROW	**Forward Staging Area:** Pipeline ROW (b) (7)(F),

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open with some cut banks along the river at high water	Tundra
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear

IV. General Site Description

Many areas of opportunity exist along the river where it parallels the pipeline.

River Data	Staging Areas	Base Map Containment Sites	CS 3-33 Atigun River
• Width = 20 - 200 ft. Flood Plain with Braided Channels • Velocity = 1 - 4 ft./sec.	• OMS 111-2 • PS 3 • Gravel Pad Onsite	CS 3-32 **CS 3-33** CS 3-34 CS 4-0 CS 4-1 CS 4-1A	C-Plan Map Ref. 17 Aerial Map Ref. 81 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Atigun River — CS 3-33

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Atigun River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive on Dalton Hwy to111 APL/AMS-2A to OMS 111-2

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Deflection booming

Winter Response Tactic(s)
Deflection booming
Ice slotting

Additional Containment Sites Above this Location:
CS 3-34

Additional Containment Sites Below this Location:
None for several miles.
CS 3-29 well downstream

III. General Site Information

Water Path:
Atigun River flows along the pipeline corridor for several miles in this region.

Water Variations:
The river is suscept ble to rain and seasonal influences. The river drains many streams and watersheds in this area.

LZ Location:
(b) (7)(F), (b) (3)

Forward Staging Area:
OMS 111-2

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Open and flat
Some cut bank at high water levels

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

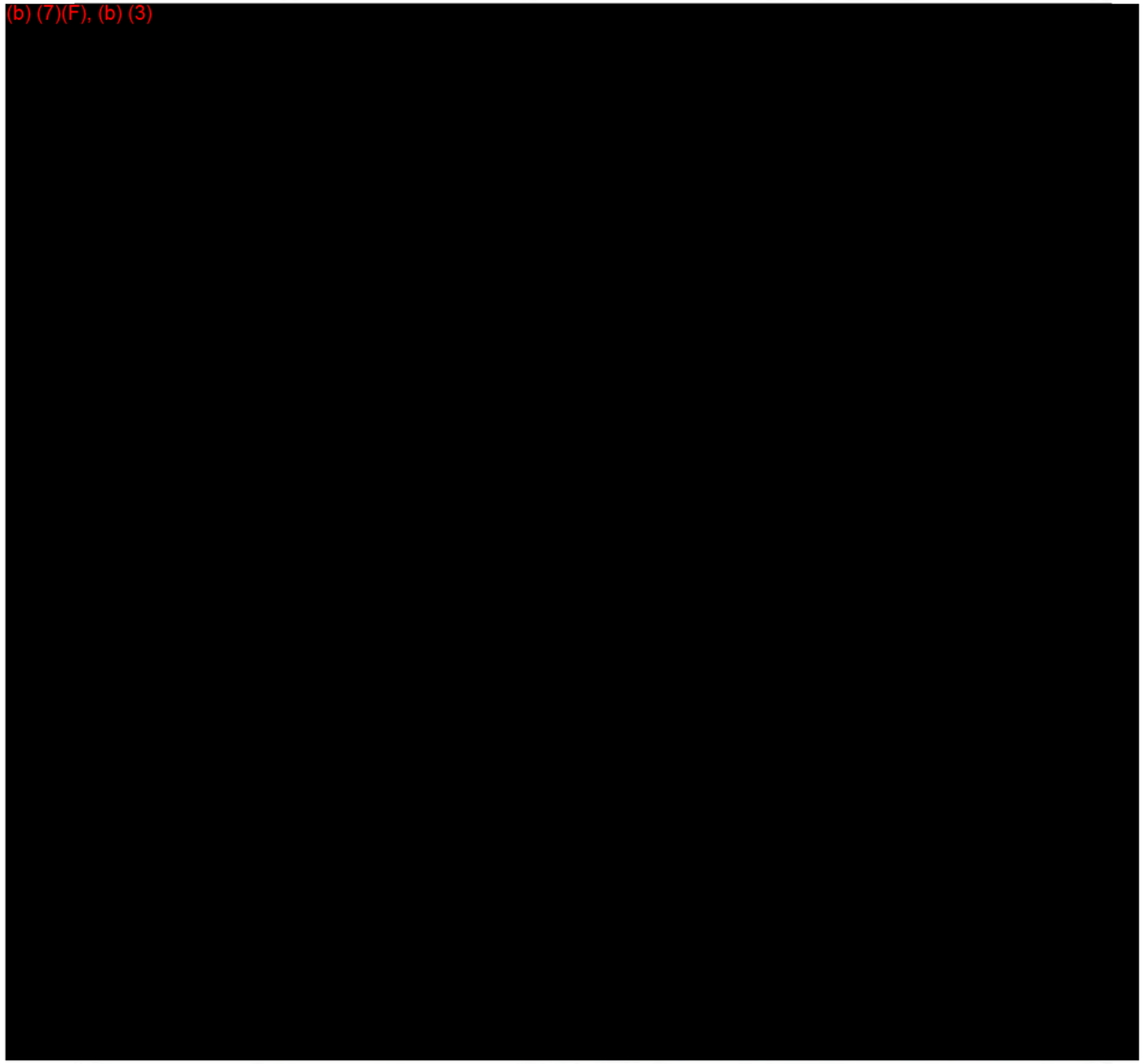
Wildlife Sensitivities: Car bou, bear, fox, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 3-34 Atigun River
• Width = 5 - 20 ft. • Velocity = 2 - 6 ft./sec.	• PS 4 • 110 APL-1B	CS 3-32 CS 4-0	CS 3-33 CS 4-1	**CS 3-34** CS 4-1A	C-Plan Map Ref. 17 Aerial Map Ref. 83 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Atigun River — CS 3-34

I. Site Location

Location Description:
Where Atigun River & Stem Creek meet at the Dalt Hwy

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive on Dalton Highway; Site is between the highway and the pipeline.

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Water dam

Winter Response Tactic(s)
Snow berming
Water dam in open areas

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 3-33 is several miles downstream of this site.

III. General Site Information

Water Path:
Stem Creek flows out of the hills and into the Atigun River at this location.

Water Variations:
The creek is suscept ble to seasonal and rain influences. Site grade is moderate, and so water will flow quickly when it rains enough for surface water run-off to occur.

LZ Location:
In open area near site

Forward Staging Area:
At site in open areas near the creek

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Gravel

Vegetation Conditions at Site:
None

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox

IV. General Site Description

This site is at the end of a long run for the creek. The creek enters a culvert drainage and control system at the site. Water dams and culvert blocks may be utilized above the highway, and small containment booms can be used below the highway where the grade levels out.

River Data	Staging Areas	Base Map Containment Sites			CS 4-0 West Fork Chandalar River
• Width = 2 - 10 ft. • Velocity = 2 - 6 ft./sec.	• Work Pad near PLMP 168	CS 3-32 CS 4-0	CS 3-33 CS 4-1	CS 3-34 CS 4-1A	C-Plan Map Ref. 18 Aerial Map Ref. 24, 25 (b) (7)(F), (b) (3) Contact AK SO Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

West Fork Chandalar River — CS 4-0

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Chandalar River Crossing of the Dalton Highway

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive Dalton Highway to 110 APL-1

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Culvert Block/manual gate system and water dam

Winter Response Tactic(s):
Culvert block
Ice slotting
Small booming operations in open areas

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 4-1A, CS 4-1

III. General Site Information

Water Path:
River parallels the highway and pipeline for several miles in this area.

Water Variations:
The river is suscept ble to seasonal and rain influences. Site is part of a long grade, and currents will increase as water levels rise.

LZ Location:
Near the gate for access to 110 APL-1

Forward Staging Area:
In open areas (b) (7)(F), (b)

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
Manual gate system for control of the culvert drainage

Stream Bank Conditions at Site:
Gravel and open

Vegetation Conditions at Site:
None

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

Site is at confluence of Unnamed Creek and the West Fork of the Chandalar River alongside the highway. Many areas of opportunity are located above and below the site as the river parallels the pipeline in this area.

River Data	Staging Areas	Base Map Containment Sites			CS 4-1 W. Fork N. Fork Chandalar R.
• Width = 20 - 100 ft. Braided Channels • Velocity = 2 - 6 ft./sec.	• Chandalar Camp • PS 4 • 109 APL-1A	CS 3-32 CS 4-0	CS 3-33 **CS 4-1**	CS 3-34 CS 4-1A	C-Plan Map Ref. 18 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Landt egal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

West Fork North Fork Chandalar River — CS 4-1

I. Site Location

Location Description:
W. Fork of the N. Fork of the Chandalar River

(b) (7)(F), (b) (3)
[redacted]

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.
Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Containment booming

Winter Response Tactic(s):
Containment booming and possible water dam in open areas
Ice slotting

Additional Containment Sites Above this Location:
CS 4-1A

Additional Containment Sites Below this Location:
None in this area

III. General Site Information

Water Path:
The Chandalar River flows away from the pipeline after Cs 4-1A.

Water Variations:
The river is suscept ble to seasonal and rain influences. Numerous bars in the area may disappear in high water levels.

LZ Location:
At site, away from river bank a short distance

Forward Staging Area:
109 APL-1A

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open. Some cut bank at higher water levels

Vegetation Conditions at Site:
Tundra with light brush

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Car bou, fox, bear, eagle

IV. General Site Description

River Data	Staging Areas	Base Map C. S. Sites	CS 4-1A W. Fork N. Fork Chandalar R.
• Width = 10 - 100 ft. Braided Channels • Velocity = 2 - 6 ft./sec.	• Work Pad @ PLMP 173 • Chandalar Camp • PS 4	CS 3-32 CS 3-33 CS 3-34 CS 4-0 CS 4-1 **CS 4-1A**	C-Plan Map Ref. 18 Aerial Map Ref. 6 (b) (7)(F), (b) (3) Contact APSC Land Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

W. Fork of N. Fork Chandalar River — CS 4-1A

I. Site Location

Location Description:
River crossing of the pipeline near MP 173

(b) (7)(F), (b) (3)
[redacted]

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive – site on ROW

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Deflection booming

Winter Response Tactic(s):
Deflection booming
Ice slotting
Snow berming

Additional Containment Sites Affected Above this Location:
None

Additional Containment Sites Below this Location:
CS 4-1

III. General Site Information

Water Path:
The Chandalar River crosses over the pipeline just above this site.

Water Variations:
The river is suscept ble to seasonal and rain influences.

LZ Location:
At site

Forward Staging Area:
On (b) (7)(F), (b) (3)
[redacted]

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat and open

Vegetation Conditions at Site:
Tundra

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, satellite phone

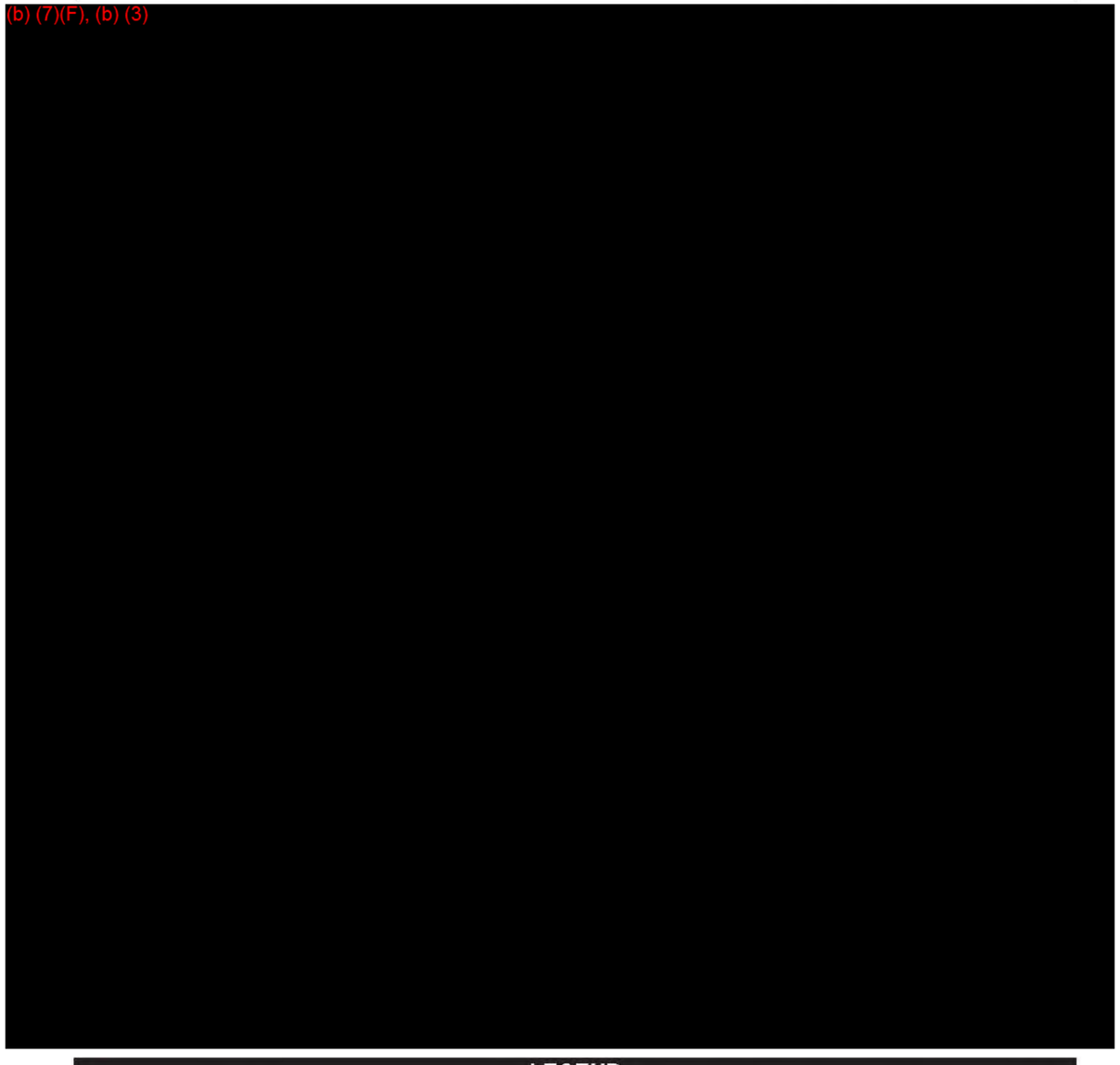
Wildlife Sensitivities: Car bou, bear, eagle, fox

IV. General Site Description

Many braided channels in the area will support areas of opportunity.

River Data	Staging Areas	Base Map Containment Sites	CS 4-2 N. Fork Chandalar River
• Width = 100 - 200 ft. • Velocity = 1 - 4 ft./sec.	• PS 4 • Chandalar Camp	CS 4-2	C-Plan Map Ref. 22 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

North Fork Chandalar River — CS 4-2

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Near north end of Chandalar Lake	N/A	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to the area around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Chandalar River flows into Chandalar Lake below this site.	The river is somewhat susceptible to seasonal and rain influences, but it is primarily lake-influenced

LZ Location:	Forward Staging Area:
At site on east side of river	Chandalar Camp

Nearest Pump Station/Response Base:

PS04

Response Equipment On Site (Kits and major items):

1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and open Some cut bank at areas along the south end of the site	Sparse trees Open areas all along the bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Lake	PS04

Communications Resources Available:

satellite phone

Wildlife Sensitivities: Car bou, eagle, fox, bear.

IV. General Site Description

The site is approximately 44 air miles to the Dietrich River.

River Data	Staging Areas	Base Map Containment Sites	CS 4-3 Middle Fork Koyukuk R.
• Width = 100 - 300 ft. • Velocity = 2 - 5 ft./sec.	• Work Pad near PLMP 205 • PS 4	CS 4-3 CS 4-9 CS 4-10 CS 4-11	C-Plan Map Ref. 21 Aerial Map Ref. 102 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Middle Fork Koyukuk River — CS 4-3

I. Site Location

Location Description:
Downstream from the pipeline crossing

(b) (7)(F), (b) (3)
[redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted],

Primary Access:	
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Ice slotting Deflection and containment booming
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
CS 4-11, CS 4-10, CS 4-9	None

III. General Site Information

Water Path:	Water Variations:
Koyukuk River crosses under the pipeline just above this site and parallels the pipeline downstream of the site.	The river is suscept ble to seasonal and rain influences. Many drainages feed into the river above this site.
LZ Location:	**Forward Staging Area:**
At site on east side of river	ROW near bridge crossing

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat and gravel Some cut bank in the area	Forest with moderate brush
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Galbraith Airport	PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Car bou, bear, fox, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 4-4 Dietrich River
• Width = 20 - 200 ft. Mutiple Channels • Velocity = 2 - 6 ft./sec.	• 108 APL-1A • PS 4	CS 4-4 CS 4-5 CS 4-7	C-Plan Map Ref. 18 Aerial Map Ref. 90, 91 (b) (7)(F), (b) (3) [redacted] Contact AFSC Land Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dietrich River

CS 4-4

I. Site Location

(b) (7)(F), (b) (3) [redacted]

Location Description:
Dietrich River near 108 APL 1A

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

Primary Access:
Drive 108 APL-1A

Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Deflection and containment booming

Winter Response Tactic(s):
Containment booming
Ice slotting

Additional Containment Sites Above this Location:
N/A

Additional Containment Sites Below this Location:
CS 4-5, CS 4-7

III. General Site Information

Water Path:
Dietrich River flows along the pipeline and highway through this area.

Water Variations:
The river is suscept ble to rain and seasonal influences.

LZ Location:
South of 108 APL-1A

Forward Staging Area:
108 APL 1A

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Gravel
Gradual slope with some cutbanks at high water

Vegetation Conditions at Site:
Forest with some brush but largely open in this area

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Eagle, car bou, fox, bear

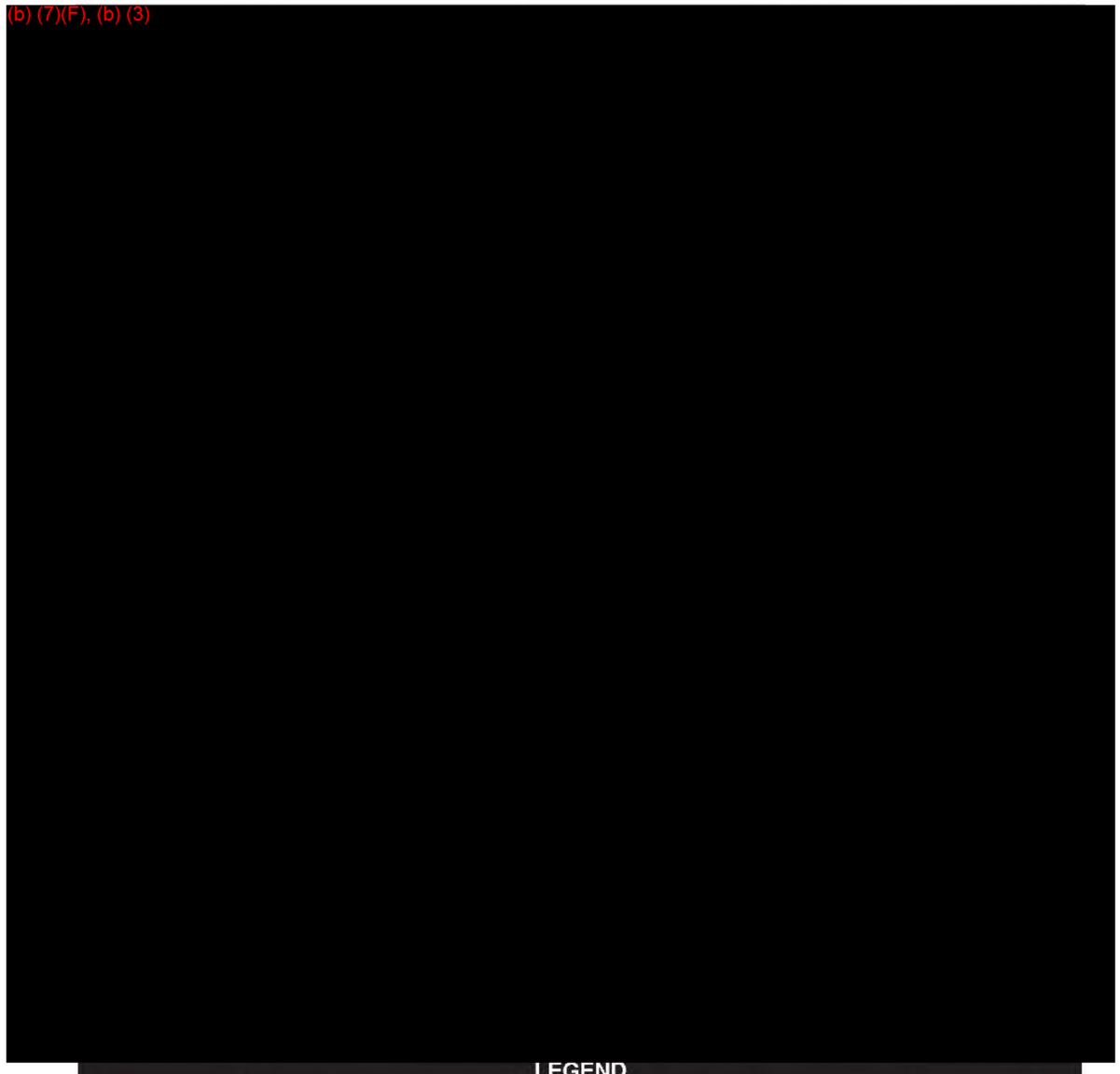
IV. General Site Description

Site has many areas of opportunity along the bank with road access to much of the corridor.

River Data	Staging Areas	Base Map Containment Sites	CS 4-5 Dietrich River
• Width = 10 - 100 ft. • Velocity = 2 - 6 ft./sec.	• PS 4 • Work Pad near PLMP 227	CS 4-4 **CS 4-5** CS 4-7	C-Plan Map Ref. 19 Aerial Map Ref. 83 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dietrich River

CS 4-5

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
(b) (7)(F), (b) (3)

PS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive – site is on ROW	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Snow berming Ice slotting Deflection and containment booming
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
CS 4-4	CS 4-7

III. General Site Information

Water Path:	Water Variations:
Dietrich River flows along the pipeline in this area.	The multiple braided channels of this river are susceptible to rain and seasonal influences.
LZ Location:	**Forward Staging Area:**
At site or ROW	(b) (7)(F),

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gradual and stable	Trees and vegetation
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
PS04	PS04

Communications Resources Available:
VHF, ARTS, satellite phone

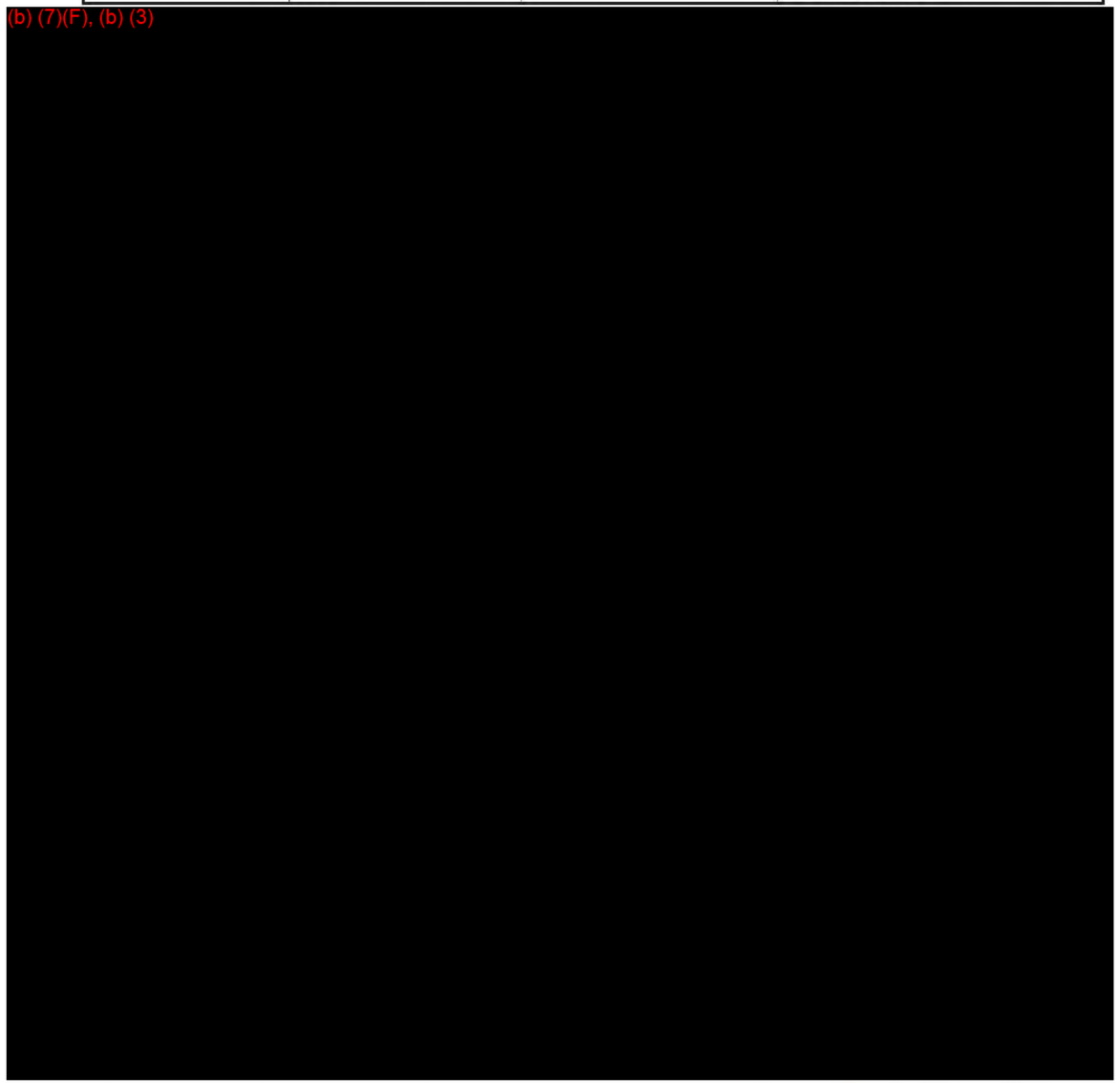
Wildlife Sensitivities: Eagle, car bou, fox, bear

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 4-7 Dietrich River
• Width = 10 - 100 ft. Braided Channels • Velocity = 1 - 5 ft./sec.	• OMS 106-2 • 106 APL/AMS-2B • Work Pad near PLMP 189.5 • PS 4	CS 4-4 CS 4-5 CS 4-7	C-Plan Map Ref. 19 Aerial Map Ref. 85 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dietrich River

CS 4-7

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Dietrich River near the pipeline

PS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive – site is just off the ROW

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Containment booming and water dam

Winter Response Tactic(s):
Ice Slotting
Snow berming
Containment booming and water dam in open areas

Additional Containment Sites Above this Location:
CS 4-4, CS 4-5

Additional Containment Sites Below this Location:
CS 4-7

III. General Site Information

Water Path:
Dietrich River flows along the pipeline for several miles in this area.

Water Variations:
Levels range from very low and shallow to high water with little to no gravel bars present. The river has wide floodplain in the area.

LZ Location:
At site between highway and river

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex staged at RGV34, Boom

Stream Bank Conditions at Site:
Gravel and gradual slope

Vegetation Conditions at Site:
Some brush but largely open area all around site

Location of Nearest Initial Helicopter Refueling Point:
Galbraith Airport

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, Satellite phone

Wildlife Sensitivities: Bear, fox. waterfowl

IV. General Site Description

The flood plan is wide in the area.

The river is suscept ble to rapid increases in water level due to the number of drainages in the area and the shallow river bed.

River Data	Staging Areas	Base Map Containment Sites	CS 4-9 Snowden Creek
• Width = 25 - 70 ft. • Velocity = 2 - 6 ft./sec.	• 105 APL/AMS-1A • PS 4	CS 4-3 **CS 4-9** CS 4-10 CS 4-11	C-Plan Map Ref. 20 Aerial Map Ref. 99 (b) (7)(F), (b) (3) Contact AP-SC Land Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Snowden Creek — CS 4-9

I. Site Location

Location Description:	GPS Coordinates:
Snowden Creek crossing of the pipeline (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive – short walk or drive off the ROW	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam at low water and containment boom at high water or larger channels	Ice slotting Snow berming Water dam in open channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None in the nearby area	CS 4-10, CS 4-3

III. General Site Information

Water Path:	Water Variations:
Dietrich River flows along the pipeline for several miles along this area.	The river is suscept ble to seasonal and rain influences. Several narrow channels migrate seasonally.

LZ Location:	Forward Staging Area:
At site or near pipeline just downstream of the site	105 APL/AMS-1A

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel with gradual slope	Moderate trees and brush in the area but the site is open in all directions

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Galbraith Airport	PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose. bears, waterfowl, eagle

IV. General Site Description

Site is just below the pipe crossing.

Several areas of opportunity are located in the area to support additional containment sites.

River Data	Staging Areas	Base Map Containment Sites	CS 4-10 Dietrich River
• Width = 10 - 150 ft. Multiple Braided Channels • Velocity = 1 - 5 ft./sec.	• 104 APL/AMS-3 • PS 4	CS 4-3 CS 4-9 **CS 4-10** CS 4-11	C-Plan Map Ref. 21 Aerial Map Ref. 100 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dietrich River — CS 4-10

I. Site Location

(b) (7)(F), (b) (3)

[redacted]

Location Description:
Dietrich River near the Dietrich Camp

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive via 104 APL/AMS-3

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy recovery and transfer systems at associated containment sites.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Deflection and containment booming

Winter Response Tactic(s):
Ice slotting
Snow berming
Deflection and containment booming

Additional Containment Sites Above this Location:
CS 4-4 is the only one in the nearby region

Additional Containment Sites Below this Location:
CS 4-3

III. General Site Information

Water Path:
Dietrich River flows along the pipeline for several miles in the area.

Water Variations:
The river is suscept ble to seasonal and rain influences and has numerous gravel bars in the area.

LZ Location:
Near the Dietrich River Camp

Forward Staging Area:
Dietrich River Camp

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:
Gravel with some cut bank areas

Vegetation Conditions at Site:
Trees and light brush in the area but the site is open

Location of Nearest Initial Helicopter Refueling Point:
PS04

Utilize Additional Response Resources from:
PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Caribou, bear, fox, eagle

IV. General Site Description

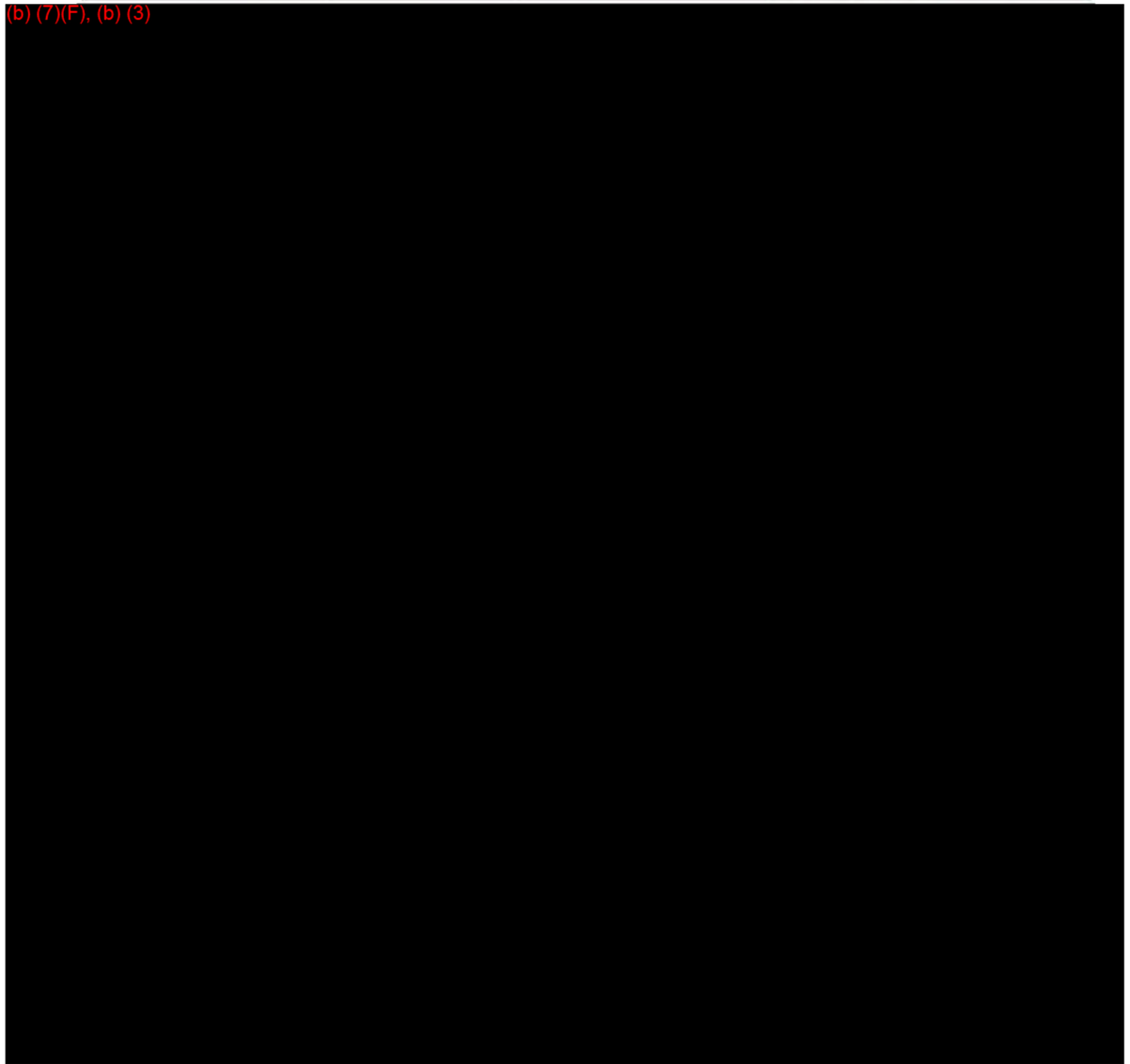
Site lies just downstream of the Dietrich Camp.

Numerous areas of opportunity are located along the river above and below this site.

River Data	Staging Areas	Base Map Containment Sites	CS 4-11 Brockman Creek
• Width = 10 - 20 ft. Multiple Braided Channels • Velocity = 1 - 4 ft./sec.	• PS 4 • 104 APL/AMS-3	CS 4-3 CS 4-9 CS 4-10 CS 4-11	C-Plan Map Ref. 21 Aerial Map Ref. 101 (b) (7)(F), (b) (3) [redacted] ed legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]



LEGEND

Containment Site, Landing Zone, Water Dam, C.S. Sign, Tank, Tote, Conex, Boom, Boom Vane, Pump, Skimmer, Culvert Block, Culvert	Bridge, Highway, Boat Launch, Trail/Clearing, Water, LWC	Gate Valve, Check Valve, Pump Station, Aboveground Pipe, Belowground Pipe	Brush, Trees, Marsh, Tussock/Tundra, Sand/Gravel

Not to Scale

Alyeska pipeline

Brockman Creek CS 4-11

I. Site Location

(b) (7)(F), (b) (3) [redacted]

Location Description: Brockman Creek confluence with the Dietrich River	**GPS Coordinates:** (b) (7)(F), (b) (3) [redacted]
Primary Access: Helicopter	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s): Deflection booming and water dams in channels as water levels dictate	**Winter Response Tactic(s):** Ice slotting Snow berming Water dams in open areas
Additional Containment Sites Above this Location: CS 4-10, CS 4-9	**Additional Containment Sites Below this Location:** CS 4-3

III. General Site Information

Water Path: Brockman Creek enters the Dietrich River just below the site.	**Water Variations:** The creek consists of numerous braided channels The creek is suscept ble to seasonal and rain influences due to a wide floodplain.
LZ Location: At the site	**Forward Staging Area:** (b) (7)(F), (b) (3) [redacted]

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site: Gravel with some cut banks at high water	**Vegetation Conditions at Site:** Trees and moderate brush
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, fox, eagle

IV. General Site Description

Site has many areas of opportunity that will support containment nearby both upstream and just below the confluence with the Dietrich River.

River Data	Staging Areas	Base Map C. S. Sites	CS 4-11A Middle Fork Koyukuk River
• Width = 200 - 300 ft. • Velocity = 1 - 4 ft./sec.	• 101 APL-1 • PS 5	CS 4-11A	C-Plan Map Ref. 23 Aerial Map Ref. 110, 111 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh
Water Dam	Boat Launch	Pump Station	Trees
C.S. Sign	Trail/Clearing	Aboveground Pipe	Tussock/Tundra
Tank	Water	Belowground Pipe	Sand/Gravel
Tote	LWC		
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Middle Fork Koyukuk River — CS 4-11A

I. Site Location

Location Description:	S Coordinates:
Pipeline and highway crossing of the Koyukuk River	(b) (7)(F), (b) (3) [redacted]
Primary Access: Drive	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Utilize the boom vanes to divert oil to containment and recovery sites.

Deploy recovery and transfer systems at associated containment sites.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming at areas of opportunity	Ice slotting Water dam in low channels Deflection and containment booming at areas of opportunity
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** None in the nearby area

III. General Site Information

Water Path:	Water Variations:
The river flows under the pipeline just above the site and generally flows along the pipe on either side for several miles.	The river is suscept ble to seasonal and rain influences Many braided channels are above and below the site.
LZ Location: Along the river bank, site has numerous options	**Forward Staging Area:** At site. Several roads and access areas are established

Nearest Pump Station/Response Base:
PS04

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel Some cutbanks and drop off along the bank but typically stable area	Trees and moderate brush but site and surrounding area are clear
Location of Nearest Initial Helicopter Refueling Point: Galbraith Airport	**Utilize Additional Response Resources from:** PS04

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, fox, eagle

IV. General Site Description

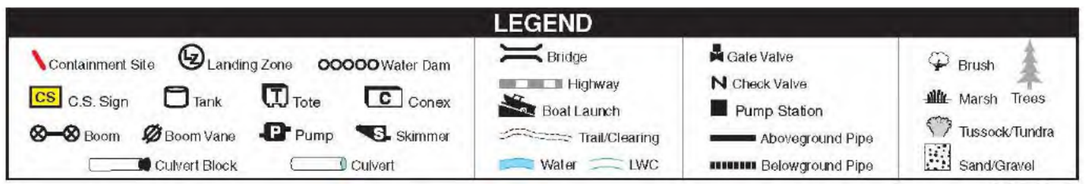
Site has multiple areas for deflection and containment.

Wiseman road parallels the river for a short distance and offers additional sites of opportunity.

River Data	Staging Areas	Base Map Containment Sites	CS 4-11B M. Fork Koyukuk R.
• Width = 100 - 300 ft. • Velocity = 1 - 3 ft./sec.	• 97 APL-3 • PLMP 241 Work Pad • PS 5	CS 4-11B CS 4-14 CS 4-15 CS 4-16 CS 4-16A	C-PLan Map Ref. 24 Aerial Map Ref. 119 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]



Not to Scale

Alyeska pipeline

M. Fork Koyukuk River

CS 4-11B

(b) (7)(F), (b) (3)

[redacted]

I. Site Location

Location Description:	GPS Coordinates:
Middle Fork Koyukuk River	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat Launch access from upstream on the river

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy deflection boom to divert oil to containment and recovery areas.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming. Deflection booming Possible use of boom vane for deflection booming	Containment booming Deflection booming Possible use of boom vane for deflection booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 4-14 and CS 4-15

III. General Site Information

Water Path:	Water Variations:
The Middle Fork of the Koyukuk River continues to flow south from this location along the Dalton Highway.	The river is suscept ble to seasonal variations with strong flows after break-up and slower flowcurrent in winter.

LZ Location:	Forward Staging Area:
At Containment site location north of site approximately one-eighth of a mile	At containment site location north of site approximately one-eighth of a mile

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has easy to moderate access (slight slope) from the LZ.	Access to River from LZ is clear; the opposite side of the river bank has a gravel bar that may be used for response activities during low water conditions.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk River, moose, bear, eagle

IV. General Site Description

Numerous side channels are in the braided river system. Tactics include booming several channels from this containment site.

River Data	Staging Areas	Base Map Containment Sites	CS 4-14 Trent's Trickle
• Width = 3 - 5 ft. • Velocity = 1 - 3 ft./sec.	• PLMP 246 Work Pad • PS 5	CS 4-11B **CS 4-14** CS 4-15 CS 4-16 CS 4-16A	C-Plan Map Ref. 25 Aerial Map Ref. 122 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Trent's Trickle — CS 4-14

I. Site Location

Location Description:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Dalton Highway access

Secondary Access:
LZ near workpad for helicopter access

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.

Establish culvert block containment to maximize recovery options.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Deploy culvert block and containment booming at road crossing to contain oil above the site.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):
Underflow and water dam booming
Low water - high water tactic site

Winter Response Tactic(s):
Underflow and water dam booming
Low water - high water tactic site

Additional Containment Sites Above this Location:
None applicable

Additional Containment Sites Below this Location:
CS 4-15

III. General Site Information

Water Path:
Trent's Trickle flows into the Middle Fork of the Koyukuk River which continues to flow south away from the Dalton Highway.

Water Variations:
Slight seasonal variation with strong flows after break-up and no flow in winter.

LZ Location:
Between work pad and Dalton Highway south of the culvert

Forward Staging Area:
Between work pad and Dalton Highway south of the culvert

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
None - easy access to culvert from the LZ, work pad and Dalton Highway.

Vegetation Conditions at Site:
Access to culvert from LZ is clear; some black spruce and alder stands but none that would restrict access.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS radio, VHF, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs alongside channels of the Koyukuk, bear, eagle, moose

IV. General Site Description

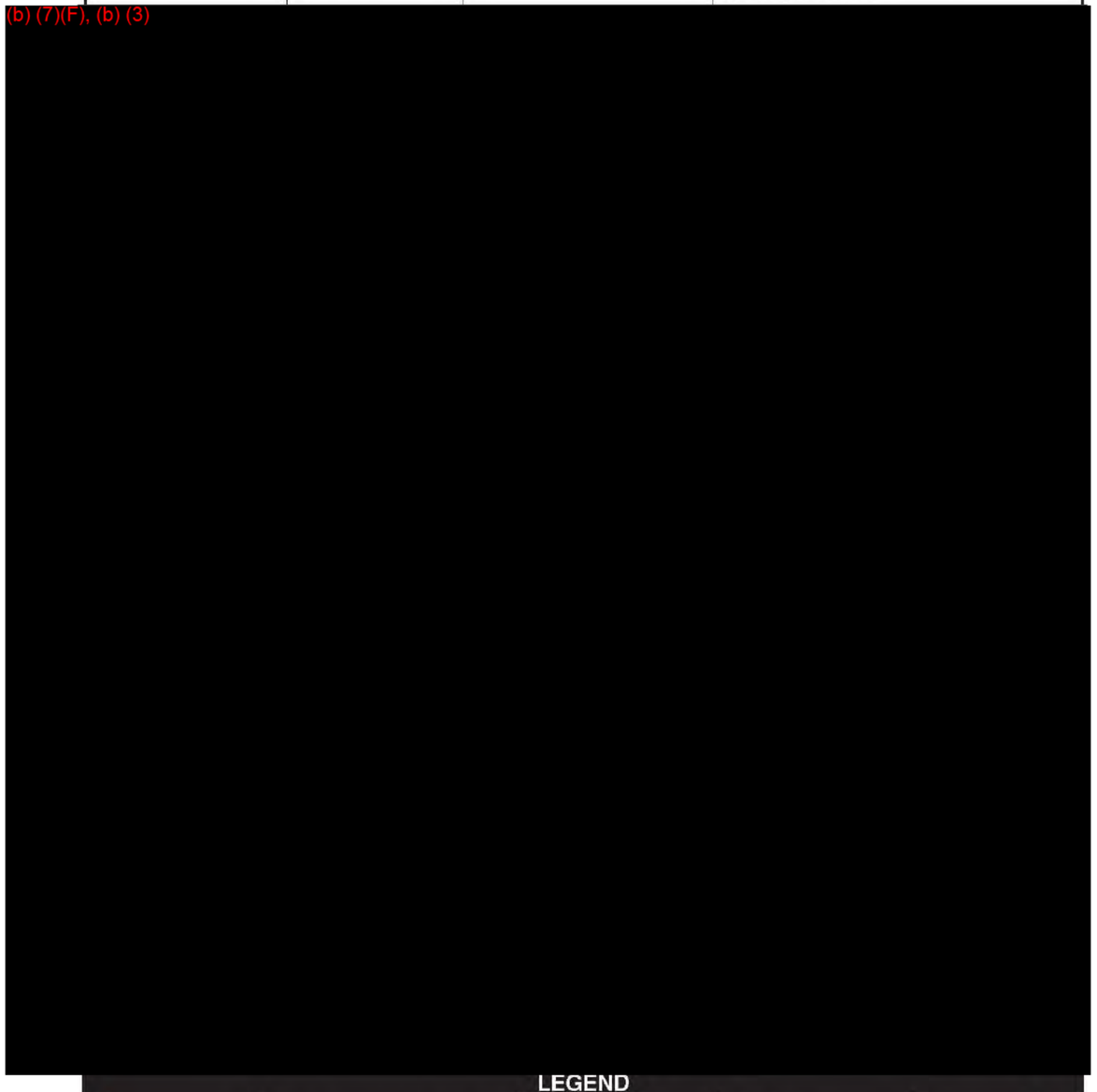
Culvert has easy access and ample staging areas for response activities. Water eventually travels to the Middle fork of the Koyukuk River.

Large gravel bar is at the confluence with the Koyukuk River for staging other sites.

River Data	Staging Areas	Base Map Containment Sites	CS 4-15 Middle Fork Koyukuk River
• Width = 20 - 150 ft. • Velocity = 1 - 5 ft./sec.	• OMS 97-2 • PS 5 • 97 APL/AMS-1	CS 4-11B CS 4-14 **CS 4-15** CS 4-16 CS 4-16A	C-Plan Map Ref. 25 Aerial Map Ref. N/A • (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

M. Fork Koyukuk River — CS 4-15

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Middle Fork Koyukuk River.	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access from upstream

II. Staging Area Objectives and Data

Strategic Response Objective(s)

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Deflection booming Possible use of boom vane for deflection booming	Containment booming Deflection booming Possible use of boom vane for deflection booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 4-14 CS 4-15 CS 4-11B	CS 4-16 and CS 4-16A

III. General Site Information

Water Path:	Water Variations:
The Middle Fork of the Koyukuk River continues to flow south from this location. The site is a good distance from the Dalton Highway.	Seasonal variation with strong flow after break-up, slower flowcurrents in winter, or no flow.

LZ Location:	Forward Staging Area:
At containment site location on the north side of the site	At containment site location on the north side of the site

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has easy access from the LZ.	Access to River from LZ is clear; the opposite side of the River bank has a gravel bar that may be used for response activities during low water conditions.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, bear, moose, eagle, waterfowl

IV. General Site Description

Numerous side channels are in braided river system. Tactics include booming several channels from this containment site.

There are areas of opportunity upstream.

North

River Data	Staging Areas	Base Map Containment Sites	CS 4-16 Chapman Creek
• Width = 10 - 40 ft. • Velocity = 1 - 2 ft./sec.	• 96 APL-2A • 96 APL/AMS-1	CS 4-11B CS 4-14 CS 4-15 CS 4-16 CS 4-16A C-Plan Map Ref. 25 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.	North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Chapman Creek CS 4-16

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Middle Fork Koyukuk River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access from Koyukuk

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Ensure responder safety through the use of site-specific safety procedures.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water Dam booming Low water - high water tactic site	Water Dam booming Low water - high water tactic site

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 4-15	CS 4-16A (with conex)

III. General Site Information

Water Path:	Water Variations:
The Middle Fork of the Koyukuk River continues to flow south from this location. The site is a good distance from the Dalton Highway.	The river is suscept ble to seasonal variation with strong flow after break-up, slower flowcurrents in winter, or no flow.

LZ Location:	Forward Staging Area:
None designated but there are many locations of opportunity for a helicopter to land	None designated but there are many locations of opportunity for staging to occur

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has easy access from the LZ	Access to River from LZ is clear; the opposite side of the River bank has a gravel bar that may be used for response activities during low water conditions.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, moose, bear

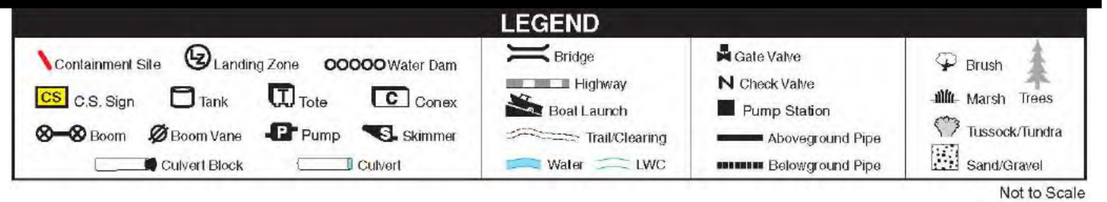
IV. General Site Description

Numerous side channels are in the braided river system. Tactics include booming several channels from this containment site.

River Data	Staging Areas	Base Map Containment Sites	CS 4-16A M. Fork Koyukuk R.
• Width = 100 - 250 ft. • Velocity = 1 - 4 ft./sec.	• Landing Strip on site • OMS 96-1 • PS 5	CS 4-11B CS 4-14 CS 4-15 CS 4-16 **CS 4-16A**	C-Plan Map Ref. 25 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Middle Fork Koyukuk River CS 4-16A

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Middle Fork Koyukuk River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates – landing strip on site	Boat access from far upstream

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Deflection booming Possible use of boom vane for deflection booming	Containment booming Deflection booming Possible use of boom vane for deflection booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 4-11B CS 4-14	None

III. General Site Information

Water Path:	Water Variations:
The Middle Fork of the Koyukuk River continues to flow south from this location; the site is the last containment site on the Middle Fork of the Koyukuk and is a good distance from the Dalton Highway.	The river is suscept ble to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.
LZ Location: Designated in the gravel pit area on the north side of the site	**Forward Staging Area:** None designated but there are many locations of opportunity for staging to occur

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has easy access from the LZ and staging area.	Access to River from LZ is clear; the opposite side of the River bank has a steep bank to the water.
Location of Nearest Initial Helicopter Refueling Point: PS05	**Utilize Additional Response Resources from:** PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, moose, bear, waterfowl

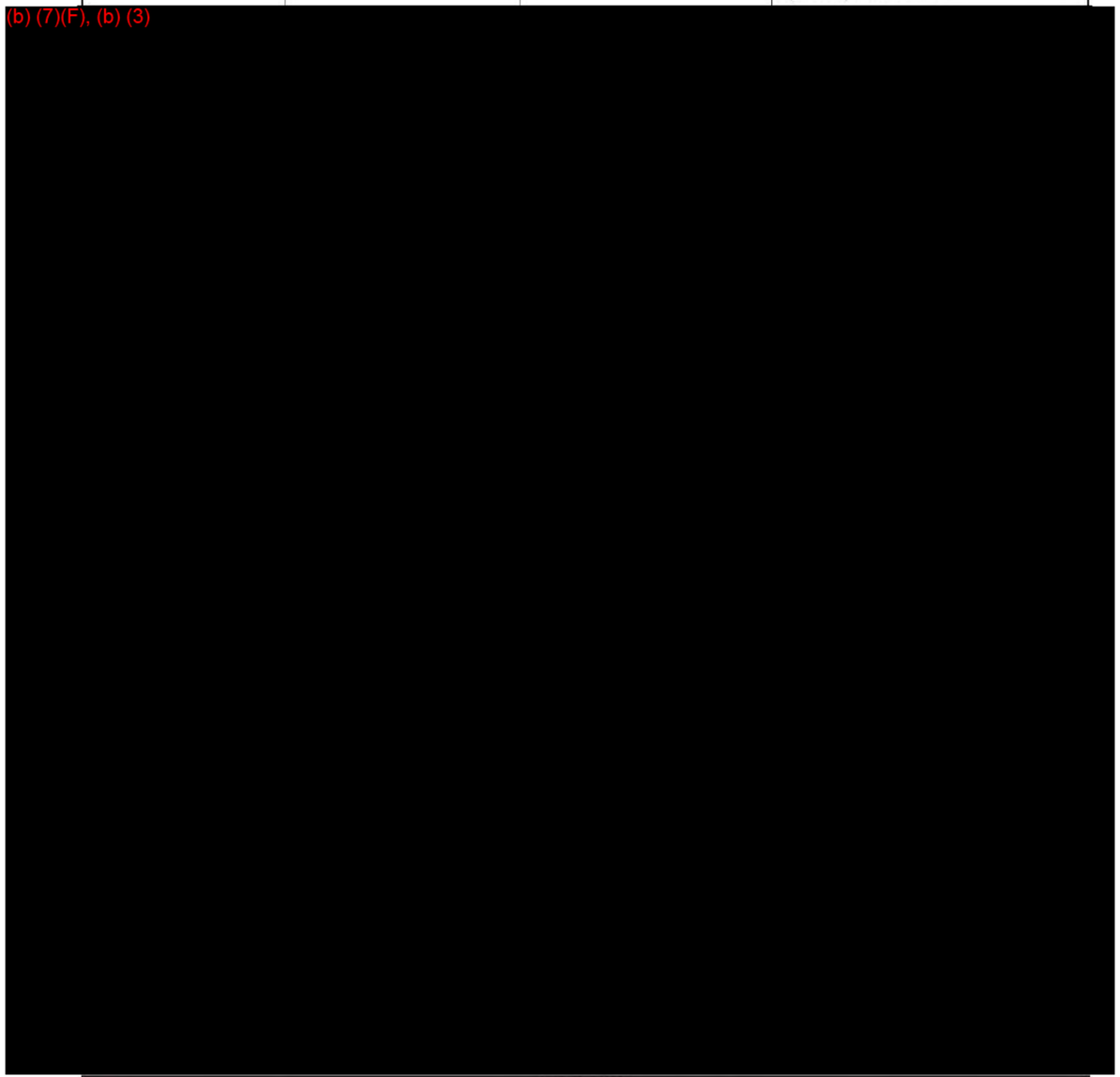
IV General Site Description

Numerous side channels in braided river system. Tactics include booming at several locations in the channel from this containment site.

Mining operation, landing strip and other trails are located around the site area.

River Data	Staging Areas	Base Map Containment Sites			CS 4-17 S. Fork Koyukuk R.
• Width = 100 ft. - 150 ft. • Velocity = 2 - 5 ft./sec.	• Gold Bench Mine Airstrip • PS 5	CS 4-17 CS 4-21	CS 4-18 CS 4-23	CS 4-20 CS 4-24	C-Plan Map Ref 26W Aerial Map Ref N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

S. Fork Koyukuk River — CS 4-17

I. Site Location

Location Description:	Nearest Highway MP	GPS Coordinates:
S. Fork Koyukuk River 9 miles downstream of Pipeline	N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Primary Access:	Se
Helicopter access using GPS coordinates	Boat access from several miles downstream

II. Staging Area Objectives and Data

Strategic Response Objective(s)

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Deflection booming Possible use of boom vane for deflection booming	Containment booming Deflection booming Possible use of boom vane for deflection booming

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 4-20	CS 4-21	None
CS 4-18	CS 4-23	

III. General Site Information

Water Path:	Water Variations:
The South Fork of the Koyukuk River continues to flow southwest from this location; the site is the last containment site on the South Fork of the Koyukuk and is 9 miles from the Dalton Highway.	The river is suscept ble to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.
LZ Location: Designated on the west side of the site Gold Bench Mine Airstrip is located close-by.	**Forward Staging Area:** None designated but there are many locations of opportunity for staging to occur

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has moderate to steep access to the River from the LZ and staging area.	Access to River from LZ is clear but relatively steep; the opposite side of the River bank is more gently sloping but clear of vegetation.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, moose, bear, eagle, waterfowl

IV. General Site Description

Tactics include booming several locations from this containment site.

Numerous other opportunities on the river could be based from the airstrip.

River Data	Staging Areas	Base Map Containment Sites			CS 4-18 Unnamed Creek
• Width = 4 - 8 ft. • Velocity = 2 - 5 ft./sec.	• 94 APL-1A • PS 5	**CS 4-18** CS 4-23 CS 4-28	CS 4-20 CS 4-24 CS 4-29	CS 4-21 CS 4-27	C-Plan Map Ref. 26 Aerial Map Ref. 126 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 4-18

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:
Helicopter access using GPS coordinates

Boat access from upstream

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Utilize the boom vanes to divert oil to containment and recovery sites.

Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Water dam booming
Low water - high water tactic site

Winter Response Tactic(s):
Water dam booming
Low water - high water tactic site.

Additional Containment Sites Above this Location:
CS 4-21 CS 4-18
CS 4-23 CS 4-24

Additional Containment Sites Below this Location:
CS 4-20

III. General Site Information

Water Path:
Unnamed Creek flows south into the South Fork of the Koyukuk River which continues to flow southwest to CS 4-20.

Water Variations:
Small tributary is susceptible to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:
Designated on the east side of the site on an upstream gravel bar on the South Fork of the Koyukuk

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access to the River from Unnamed Creek.

Vegetation Conditions at Site:
Access to River from the site is clear; the gravel bar (where the LZ is located) is more gently sloping and clear of vegetation.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, moose, bear, waterfowl

IV. General Site Description

Tactics include booming in several channels at the mouth of Unnamed Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 4-20 S. Fork Koyukuk River
• Width = 100 - 250 ft. • Velocity = 1 - 3 ft./sec.	• 94 APL-1A • Word pad near PLMP 256 • PS 5	CS 4-18 CS 4-20 CS 4-21 CS 4-23 CS 4-24 CS 4-27 CS 4-28 CS 4-29	C-Plan Map Ref. 26 Aerial Map Ref. 126 (b) (7)(F), (b) (3) Contact APSC Land Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

S. Fork Koyukuk River — CS 4-20

(b) (7)(F), (b) (3)

I. Site Location

Location Description:	GPS Coordinates:
Confluence of Unnamed Creek and South Fork Koyukuk River 2 miles downstream of Pipeline	(b) (7)(F), (b) (3)

Primary Access:	
Helicopter access using GPS coordinates	Boat access via South Fork Koyukuk River

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.

Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Deflection booming Possible use of boom vane for deflection booming	Containment booming Deflection booming Possible use of boom vane for deflection booming
Additional Containment Sites Above this Location: CS 4-21	**Additional Containment Sites Below this Location:** CS 4-17

III. General Site Information

Water Path:	Water Variations:
The South Fork of the Koyukuk River continues to flow southwest from this location. Approximately 7 miles downstream is CS 4-17 which is the last containment site on the South Fork of the Koyukuk and is 9 miles from the Dalton Highway.	The river is suscept ble to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.
LZ Location: Designated on the west side of the river	**Forward Staging Area:** (b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has moderate to steep access to the River from the LZ and staging area.	Access to River from LZ is clear but relatively steep; the opposite side of the River bank is gravel bar which is more gently sloping but clear of vegetation.
Location of Nearest Initial Helicopter Refueling Point: PS05	**Utilize Additional Response Resources from:** PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, bear, moose, eagle

IV. General Site Description

Tactics include booming at several locations in the north and south of this containment site.

This site has areas of opportunity upstream of the site for additional water dams.

River Data	Staging Areas	Base Map Containment Sites	CS 4-21 S. Fork Koyukuk River
• Width = 100 - 400 ft. • Velocity = 1 - 4 ft./sec.	• 94 APL-1A • Work Pad near PLMP 257 • PS 5	CS 4-18 CS 4-20 **CS 4-21** CS 4-23 CS 4-24 CS 4-27 CS 4-28 CS 4-29	C-Plan Map Ref. 26 Aerial Map Ref. 126 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

CS C.S. Sign | Tank | T Tote | C Conex | Boom | Boom Vane | P Pump | S Skimmer | Culvert Block | Culvert

Not to Scale

Alyeska pipeline SERVICE COMPANY

S. Fork Koyukuk River — CS 4-21

I. Site Location

Location Description:
On the south side of South Fork Koyukuk River

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive- on ROW.

Helicopter access using GPS coordinates

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Containment booming.
Deflection booming - Poss ble use of boom vane for deflection booming.

Winter Response Tactic(s):
Containment booming.
Deflection booming - Poss ble use of boom vane for deflection booming.

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 4-20 CS 4-17

III. General Site Information

Water Path:
The South Fork of the Koyukuk River continues to flow S/W from this location, approximately 8.5 miles downstream is CS 4-17 which is the last containment site on the South Fork of the Koyukuk and is 9 miles from the Dalton Highway.

Water Variations:
Seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:
Designated on the south side of the river.

Forward Staging Area:
On ROW nea (b) (7)(F),

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:
River has easy access to the River from the LZ and staging areas.

Vegetation Conditions at Site:
Access to River from LZ is clear; the opposite side of the River bank is gravel bar which is also gently sloping and clear of vegetation.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

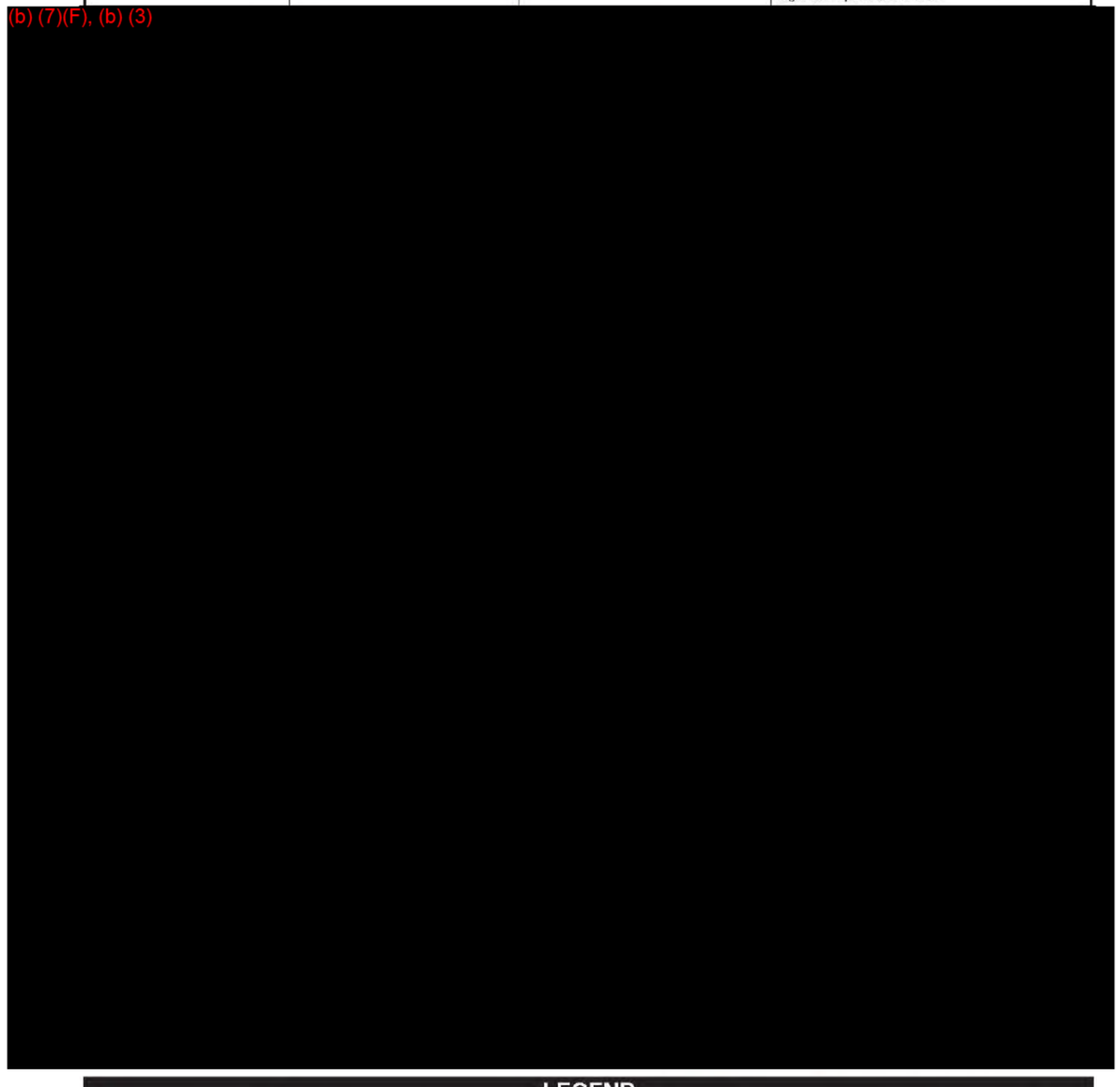
Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, moose, bear, waterfowl, eagle

IV. General Site Description

Tactics include booming at several locations in the main channel downstream of this containment site.

River Data	Staging Areas	Base Map Containment Sites			CS 4-23 S. Abba Dabba Creek
• Width = 6 - 20 ft. • Velocity = 1 - 4 ft./sec.	• 94 APL-1A • Work Pad near PLMP 256 • PS 5	CS 4-18 CS 4-23 CS 4-28	CS 4-20 CS 4-24 CS 4-29	CS 4-21 CS 4-27	C-Plan Map Ref. 26 Aerial Map Ref. 126 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

S. Abba Dabba Creek — CS 4-23

I. Site Location

Location Description:
South Fork Koyukuk River confluence of Abba Da Creek.

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:

Helicopter access using GPS coordinates	Boat access down Koyukuk River

II. Staging Area Objectives and Data

Strategic Response Objective(s)

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam booming Low water - high water tactic site with potential to use boom vane in high water	Water dam booming Low water - high water tactic site with potential to use boom vane in high water
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 4-20

III. General Site Information

Water Path:	Water Variations:
South Abba Dabba Creek flows south into the South Fork of the Koyukuk River which continues to flow S/W to CS 4-20.	Small tributary is susceptible to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.
LZ Location: Designated near a gravel bar between South Abba Dabba Creek and the South Fork of the Koyukuk	**Forward Staging Area:** On work pad (b) (7)(F),

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access to both South Abba Dabba Creek and the South Fork of the Koyukuk River.	Access to creek and river from the site is groomed and clear.
Location of Nearest Initial Helicopter Refueling Point: PS05	**Utilize Additional Response Resources from:** PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Numerous fisheries resources in sloughs along the Koyukuk, moose, bear, waterfowl

IV. General Site Description

Tactics include booming a side channel of the South Fork of the Koyukuk River and South Abba Dabba Creek.

Numerous areas of opportunity are located downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 4-24 Abba Dabba Creek
• Width = 40 - 20 ft. • Velocity = 2 - 5 ft./sec.	• 94 APL-1A • 94 AMS-0	CS 4-18 CS 4-20 CS 4-21 CS 4-23 **CS 4-24** CS 4-27 CS 4-28 CS 4-29	C-Plan Map Ref. 26 (b) (7)(F), (b) (3) [redacted] Contact AK DEC Land Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Abba Dabba Creek CS 4-24

I. Site Location

Location Description:
Culvert crossing of Abba Dabba Creek under workpad (b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted],

Primary Access:
Use 94-APL-1, travel south on work pad

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Underflow booming / C-block water dam
Either or both tactics may be used to raise water level if needed.

Winter Response Tactic(s):
Underflow booming / C-block water dam
Either or both tactics may be used to raise water level if needed.

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 4-23 CS 4-20

III. General Site Information

Water Path:
Abba Dabba Creek flows north into the South Fork of the Koyukuk River.

Water Variations:
Small tributary is susceptible to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:
LZ is at CKV 48A which is approximately 1000 feet south, another LZ of opportunity is the work pad north of the culvert crossing.

Forward Staging Area:
Work pad near 94 APL-1A

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access to both South Abba Dabba Creek and the South Fork of the Koyukuk River.

Vegetation Conditions at Site:
Access to creek and river from the site is groomed and clear.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: This creek leads to the Koyukuk River where there are numerous fisheries resources, moose, bear

IV. General Site Description

Tactics include booming on the west side of the work pad.

River Data	Staging Areas	Base Map Containment Sites	CS 4-25 Prospect Creek
• Width = 20 - 100 ft. • Velocity = 2 - 5 ft./sec.	• PS 5 • Prospect Camp	**CS 4-25** CS 4-26 CS 4-32 CS 4-33 CS 5-1 CS 5-2 CS 5-3	C-Plan Map Ref. 27 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Prospect Creek — CS 4-25

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Confluence of the Jim River and Prospect Creek	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming / water bam Low water / high water tactic site	Booming / water dam Low water / high water tactic site.

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 4-33	CS 4-26

III. General Site Information

Water Path:	Water Variations:
Prospect Creek flows west into the Jim River.	Medium tributary is suscept ble to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:	Forward Staging Area:
LZ is at confluence of Prospect Creek and Jim River.	Prospect Camp or PS05

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable soils Gradual slope Some mud bank	Burn site with moderate brush

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05 or Prospect Camp	PS05

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Moose, bear, waterfowl, eagle

IV. General Site Description

Tactics include booming several locations upstream on Prospect Creek before the confluence with Jim River.

There is an old burn area along the river bank.

River Data	Staging Areas	Base Map Containment Sites	CS 4-26 Jim River
• Width = 50 - 300 ft. • Velocity = 1 - 4 ft./sec.	• Prospect Camp • PS 5	CS 4-25 **CS 4-26** CS 4-32 CS 4-33 CS 5-1 CS 5-2 CS 5-3	C-Plan Map Ref. 27 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Jim River

CS 4-26

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
At the Jim River approximately 2 miles from Prospect Camp	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Establish storage and transfer operations at recovery sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming / deflection Possible use of boom vane for deflection booming	Booming / deflection Possible use of boom vane for deflection booming

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 4-25	CS 4-32	None
CS 5-3	CS 5-1	
CS 5-2	CS 4-33	

III. General Site Information

Water Path:	Water Variations:
Jim River flows West from this containment site.	Medium tributary is subject to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:	Forward Staging Area:
At the site	Prospect Camp

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable and flat Long gravel bars in the area	Access to creek and river from the site is groomed and clear

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05 or Prospect Camp	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Waterfowl, moose, bear

IV. General Site Description

Tactics include booming at several locations on Jim River.

There are significant burn areas along both banks.

River Data	Staging Areas	Base Map Containment Sites	CS 4-27 Grayling Creek
• Width = 3 - 30 ft. • Velocity = 1 - 2 ft./sec.	• 93 APL-2 • PS 4	CS 4-18 CS 4-20 CS 4-21 CS 4-23 CS 4-24 CS 4-27 CS 4-28 CS 4-29	C-Plan Map Ref. 26 Aerial Map Ref. 129 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Grayling Creek CS 4-27

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Grayling Creek is the south exit point of Grayling Lake

[redacted]

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter access using GPS coordinates

Secondary Access:
Boat down Grayling Lake

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):
Booming

Winter Response Tactic(s):
Booming

Additional Containment Sites Above this Location:
CS 4-28 is the CS that controls drainage into Grayling Lake

Additional Containment Sites Below this Location:
CS 4-29

III. General Site Information

Water Path:
Grayling Creek flows south from Grayling Lake.

Water Variations:
Small Creek exits Grayling Lake.

LZ Location:
LZ is located south of Grayling Lake and west of Grayling Creek.

Forward Staging Area:
93 APL-4

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to creek and lake from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

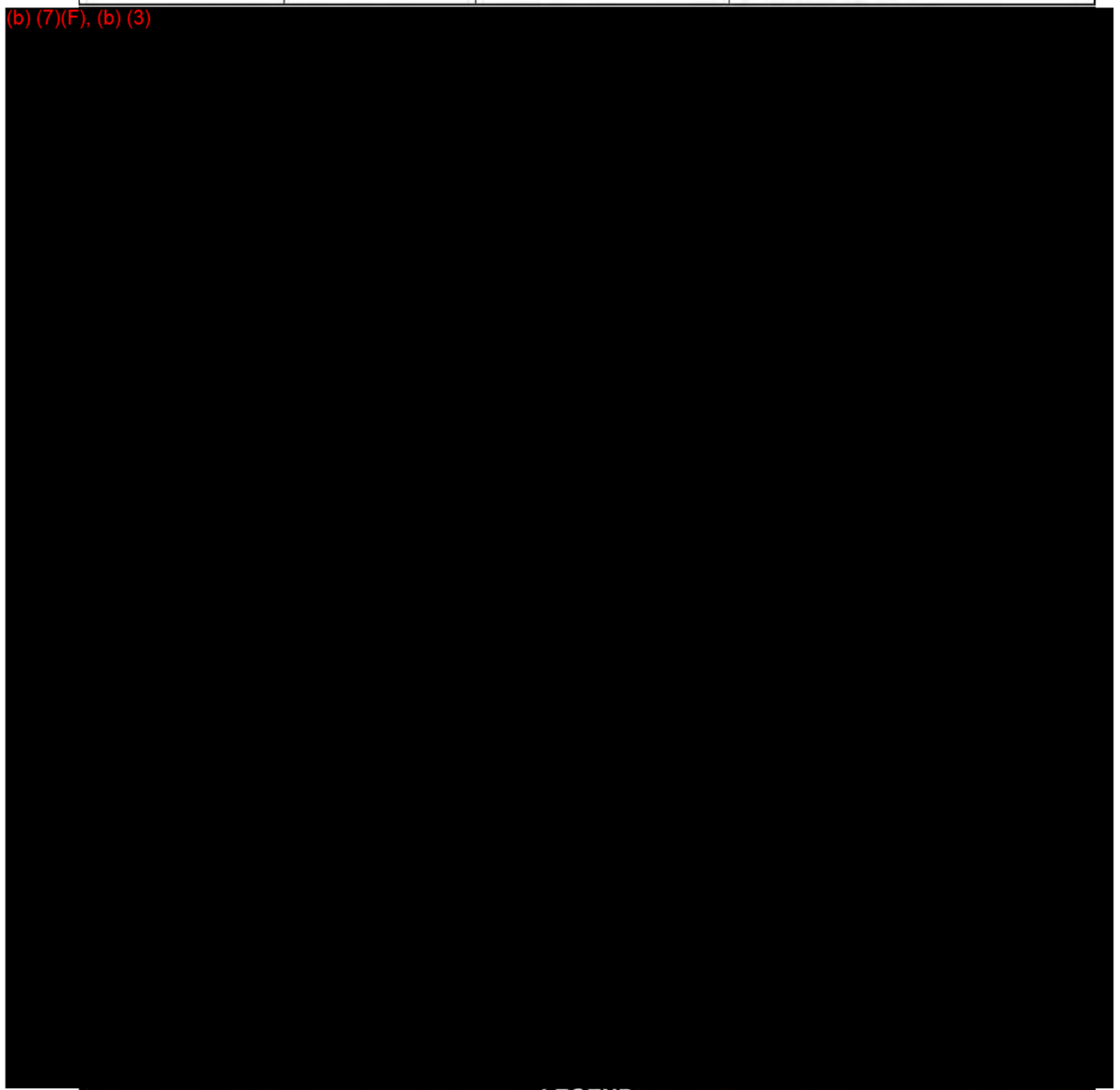
Wildlife Sensitivities: Moose, bear, waterfowl

IV. General Site Description

Tactics include booming several locations along Grayling Creek.

River Data	Staging Areas	Base Map Containment Sites			CS 4-28 Drainage to Grayling Lake
• Width = 2 - 4 ft. • Velocity = 1 - 3 ft./sec.	• 93 APL-4 • PS 5	CS 4-18 CS 4-23 CS 4-28	CS 4-20 CS 4-24 CS 4-29	CS 4-21 CS 4-27	C-Plan Map Ref. 26 Aerial Map Ref. 128,129 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Drainage to Grayling Lake CS 4-28

I. Site Location

(b) (7)(F), (b) (3)

Location Description:		GPS Coordinates:
Culvert site which drains under Dalton Highway into Grayling Lake		(b) (7)(F), (b) (3)
Primary Access: (b) (7)(F), (b) (3)	**Secondary Access:** Drive	

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow booming / C-block water dam – Either or both tactics may be used to raise water level if needed.	Underflow booming / C-block water dam – Either or both tactics may be used to raise water level if needed..
Additional Containment Sites Above this Location: CS 4-28 is the CS that controls drainage into Grayling Lake	**Additional Containment Sites Below this Location:** CS 4-27 is the site that controls drainage that exits Grayling Lake. CS 4-29

III. General Site Information

Water Path:	Water Variations:
Grayling Creek flows south from Grayling Lake.	Small Creek exits Grayling Lake.
LZ Location: LZ is located north of Grayling Lake and west of the Dalton Highway.	**Forward Staging Area:** 93 APL-4

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access from the Dalton Highway.	Access to culvert and lake from the site is clear.
Location of Nearest Initial Helicopter Refueling Point: PS05	**Utilize Additional Response Resources from:** PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Moose, bear, waterfowl

IV General Site Description

This site has a marshy area above it which may include other areas of opportunity.

An additional culvert is north of this site.

River Data	Staging Areas	Base Map Containment Sites	CS 4-29 Grayling Creek
• Width = 2 - 6 ft. • Velocity = 1 - 3 ft./sec.	• 93 APL-1 • PS 5	CS 4-18 CS 4-20 CS 4-21 CS 4-23 CS 4-24 CS 4-27 CS 4-28 **CS 4-29**	C-Plan Map Ref. 26 Aerial Map Ref. 130 (b) (7)(F), (b) (3) [redacted] permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Grayling Creek — CS 4-29

(b) (7)(F), (b) (3) [redacted]

I. Site Location

Location Description:
Grayling Creek is the second CS from the south exit point of Grayling Lake.

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

Primary Access:
93 APL-1

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):
Underflow water dam

Winter Response Tactic(s):
Underflow water dam

Additional Containment Sites Above this Location:
CS 4-28 is the CS that controls drainage into Grayling Lake; CS 4-27 is the first CS from the exit of Grayling Lake; CS 4-29 is south of CS 4-27 and is the last CS on Grayling Creek.

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Grayling Creek flows south from Grayling Lake.

Water Variations:
Small Creek exits Grayling Lake.

LZ Location:
LZ is located south of Grayling Lake and north of the confluence with the Jim River.

Forward Staging Area:
93 APL-1

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
Underflow Dam Kit, Sandbag Kit

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to creek from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Fisheries resources in Grayling Lake and Creek, moose, bear, eagle

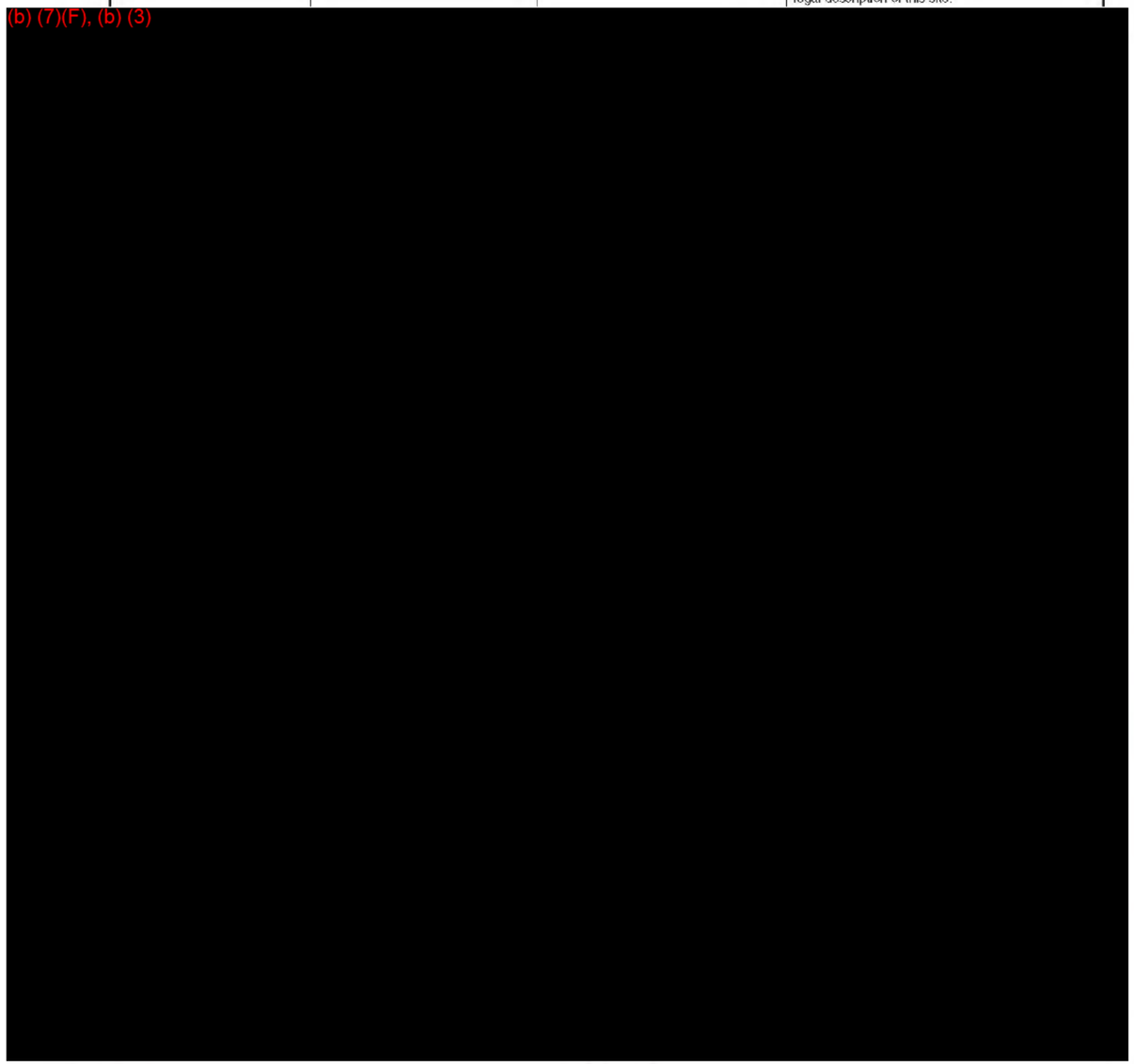
IV. General Site Description

Tactics include underflow water dam along several locations where Grayling Creek enters the Jim River.

Numerous opportunities to access Grayling Creek are located upstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 4-30 Jim River
• Width = 30 - 200 ft. • Velocity = 1 - 4 ft./sec.	• 96 APL-6 • 96 APL-4 • 92 APL-1	CS 4-30 CS 4-31	C-Plan Map Ref. 27 Aerial Map Ref. 132 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Jim River — CS 4-30

I. Site Location

Location Description:	GPS Coordinates:
(b) (7)(F), (b) (3) (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
92 APL-4 (site is on the work pad and can be accessed from both sides of the Jim River)	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming / deflection	Booming / deflection Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Jim River flows southwest along the Dalton Highway.	River is subject to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:	Forward Staging Area:
LZ is located north of the river on the work pad	96 APL-6, 96 APL-4, 92 APL-1

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to river from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Fisheries resources in Jim River, moose, bear, waterfowl

IV. General Site Description

Tactics include booming and deflection where the Jim River crosses the Dalton Highway.

River Data	Staging Areas	Base Map Containment Sites	CS 4-31 Paradise Slough
• Width = 200 - 100 ft. • Velocity = 1 - 4 ft./sec.	• 92 APL-1 • Work Pad @ PLMP 271.5	CS 4-30 **CS 4-31**	C-Plan Map Ref. 27 Aerial Map Ref. 134 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Paradise Slough CS 4-31

I. Site Location

Location Description:
Confluence of Paradise and Gas Bubble Slough

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
92 APL-0 (site is on the work pad)

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Booming

Winter Response Tactic(s):
Booming
Ice slotting

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Paradise Slough flows southwest to the Jim River Bridge #1.

Water Variations:
River is subject to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:
LZ is located south of the slough on the work pad.

Forward Staging Area:
92(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access
On ROW and open walking areas

Vegetation Conditions at Site:
Access to river from the site is clear.
Light forest with brush along the slough

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Moose, bear, waterfowl

IV. General Site Description

Tactics include booming along several locations just before Paradise Slough flows into the Jim River which crosses the Dalton Highway at Jim River Bridge #1.

River Data	Staging Areas	Base Map Containment Sites	CS 4-32 Jim River
• Width = 100 - 200 ft. • Velocity = 2 - 5 ft./sec.	• 91 APL-1B • 91 APL-1 • PS 5	CS 4-25 CS 4-26 **CS 4-32** CS 4-33 CS 5-1 CS 5-2 CS 5-3	C-Plan Map Ref. 27 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AFSC Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Jim River — CS 4-32

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
N of Prospect camp on the Jim River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter access using GPS coordinates

Secondary Access:
Winter Road from Prospect Camp

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Utilize the boom vanes to divert oil to containment and recovery sites.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Booming / deflection

Winter Response Tactic(s):
Booming / deflection

Additional Containment Sites Above this Location:
CS 4-33

Additional Containment Sites Below this Location:
CS 4-26

III. General Site Information

Water Path:
Jim River flows southwest along the Dalton Highway, and then continues to flow further west to this containment site. The last CS on the Jim River is south of this site (CS 4-26).

Water Variations:
River is subject to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.

LZ Location:
LZ is located northwest of the Prospect Camp (about 1.5 miles) on the east side of Jim River.

Forward Staging Area:
91 APL-1B, 91 APL-1

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access.
Gravel and generally sloping banks

Vegetation Conditions at Site:
Access to river from the site is clear.
Fast along the banks farther down

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Bear, waterfowl, small game, eagle

IV. General Site Description

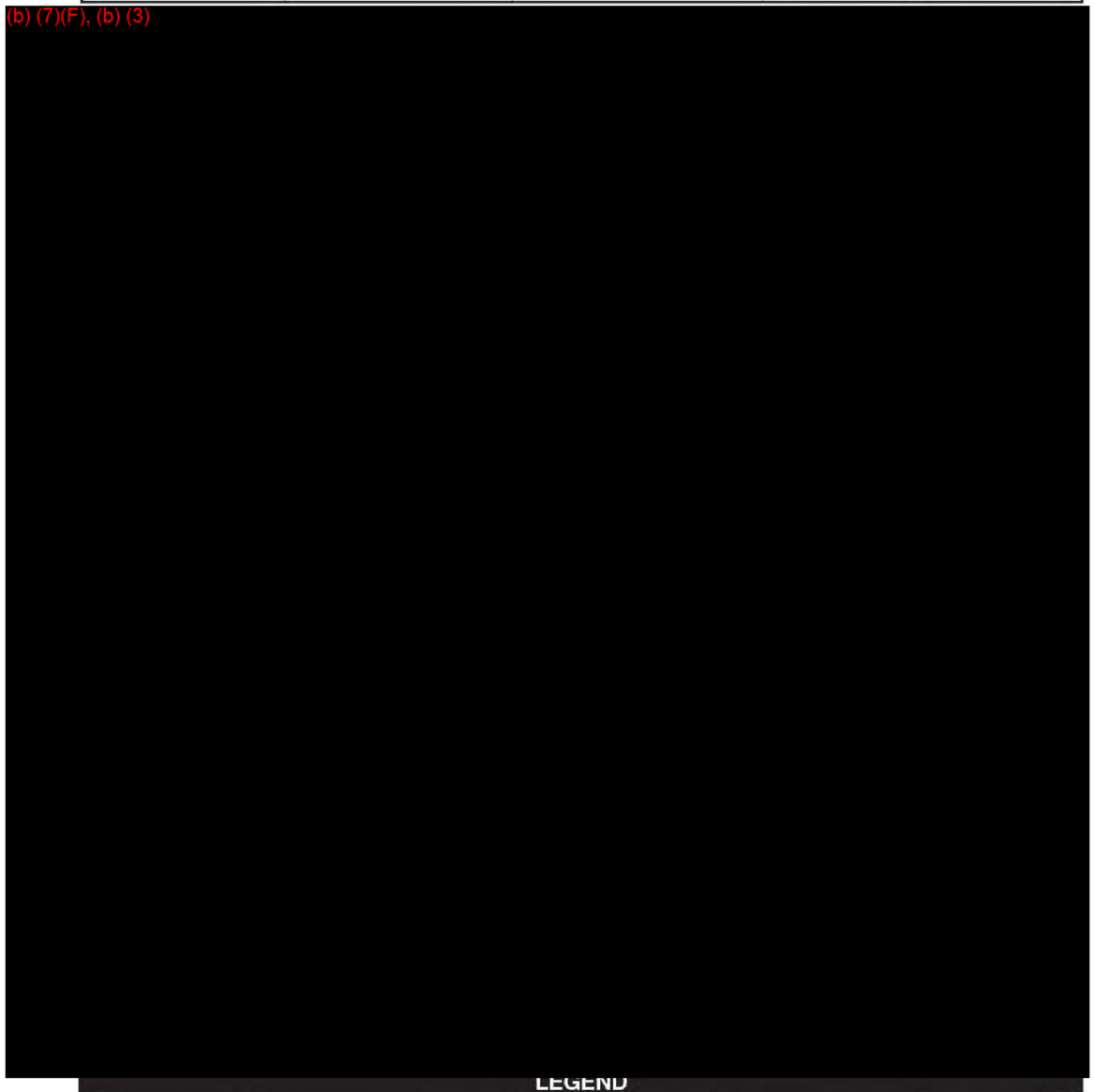
Tactics include booming along several areas of opportunity on the Jim River.

PS05 is a short distance from the site.

River Data	Staging Areas	Base Map Containment Sites	CS 4-33 Jim River
• Width = 30 - 80 ft. • Velocity = 2 - 5 ft./sec.	• PS 5	CS 4-25 CS 4-26 CS 4-32 **CS 4-33** CS 5-1 CS 5-2 CS 5-3	C-Plan Map Ref. 27 Aerial Map Ref. 136 (b) (7)(F), (b) (3) Contact AFSC Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Jim River

CS 4-33

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Near PS05 wellhouse on the Jim River	(b) (7)(F), (b) (3)

Primary Access:	
Use OMS 91-3, 1A access road	Helicopter to the far bank from PS05

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming / deflection	Booming / deflection

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None in the area	CS 4-26 CS 4-32

III. General Site Information

Water Path:	Water Variations:
Jim River flows southwest along the Dalton Highway, and then continues to flow further west to the last containment site on the Jim River which is southwest of this site (CS 4-26).	River is subject to seasonal variation with strong flow after break-up, slower flow in winter, or no flow.
LZ Location: None listed but areas of opportunity exist if needed on the access road and the far bank. PS05 is on the hill above the site.	**Forward Staging Area:** OMS 91-3, 1A

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access down the trail or along the bank.	Access to river from the site is clear. Light forest with burn areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Moose, caribou, bear, eagle, waterfowl

IV. General Site Description

Tactics include booming along several locations on the Jim River.

A recent burn area is located on the east bank.

River Data	Staging Areas	Base Map Containment Sites			CS 5-1 Swampy Drainage to Jim River
• Width = 2 - 5 ft. • Velocity = 0 - 1 ft./sec.	• PS 5 • 91 APL-1B	CS 4-25 CS 4-33 CS 5-3	CS 4-26 **CS 5-1**	CS 4-32 CS 5-2	C-Plan Map Ref. 27 Aerial Map Ref. 136 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Swampy Drainage to Jim River — CS 5-1

I. Site Location

Location Description:		GPS Coordinates:
(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive on Dalton Highway	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow / C-block water dam – low water / high water tactic site	Underflow / C-block water dam – low water / high water tactic site

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 4-32, CS 4-26

III. General Site Information

Water Path:	Water Variations:
Water in the Jim River drainage flows southwest from the Dalton Highway, and then flows west to the last containment site on the Jim River, which is southwest of this site (CS 4-26).	Drainage is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: Areas of opportunity exist if needed on the access road.	**Forward Staging Area:** PS05

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Fisheries resource in Jim River

IV. General Site Description

This site has low, swampy drainage surrounding creek banks.

River Data	Staging Areas	Base Map Containment Sites	CS 5-2 Unnamed Drainage
• Width = 2 - 5 ft. • Velocity = 0 - 1 ft./sec.	• PS 5 • 91 APL-1B	CS 4-25 CS 4-26 CS 4-32 CS 4-33 CS 5-1 **CS 5-2** CS 5-3	C-Plan Map Ref. 27 Aerial Map Ref. 136 (b) (7)(F), (b) (3) [redacted] Contact AFSC Lands Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Drainage — CS 5-2

I. Site Location

Location Description:	(b) (7)(F), (b) (3) [redacted]	GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]		(b) (7)(F), (b) (3) [redacted] ,

Primary Access:	Secondary Access:
Drive on Dalton Highway	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems, and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow / C-block water dam – low water / high water tactic site	Underflow / C-block water dam – low water / high water tactic site
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 4-32, CS 4-26

III. General Site Information

Water Path:	Water Variations:
Unnamed drainage flows southwest from the Dalton Highway, and then flows west to the last containment site on the Jim River, which is southwest of this site (CS 4-26).	Drainage is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: Areas of opportunity exist if needed on the Highway	**Forward Staging Area:** PS05

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to drainage from the site is clear.
Location of Nearest Initial Helicopter Refueling Point: PS05	**Utilize Additional Response Resources from:** PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

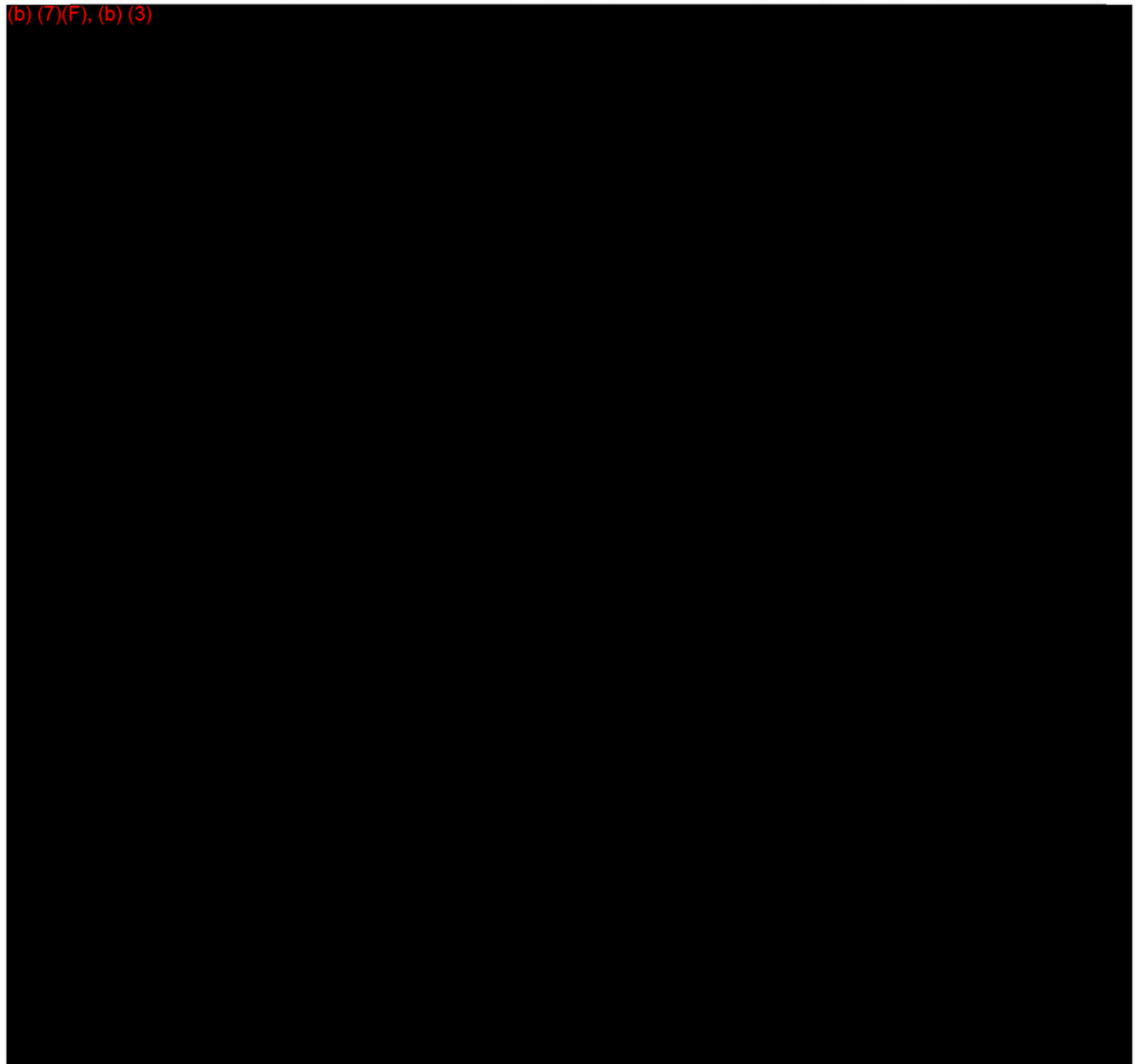
Wildlife Sensitivities: Moose, bear, eagle, fisheries resource in Jim River

IV. General Site Description

Tactics include C-block / water dam along several locations on the unnamed drainage.

River Data	Staging Areas	Base Map Containment Sites	CS 5-3 Prospect Creek
• Width = 5 - 10 ft. • Velocity = 1 - 3 ft./sec.	• PS 5 • 91 APL-1	CS 4-25 CS 4-26 CS 4-32 CS 4-33 CS 5-1 CS 5-2 **CS 5-3**	C-Plan Map Ref. 27 Aerial Map Ref. 137 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Prospect Creek CS 5-3

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Dalton Highway

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Summer Response Tactic(s):
Booming and deflection

Winter Response Tactic(s):
Booming and deflection in open areas.
Ice slotting.

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 4-25

III. General Site Information

Water Path:
Prospect Creek flows northwest past the Dalton Highway, and then flows west to the Jim River.

Water Variations:
Drainage is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location:
Areas of opportunity exist if needed on the highway and gravel bars downstream.

Forward Staging Area:
PS05

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access.
Gradual bars and some cut bank on outboard site of the creek

Vegetation Conditions at Site:
Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities:

IV. General Site Description

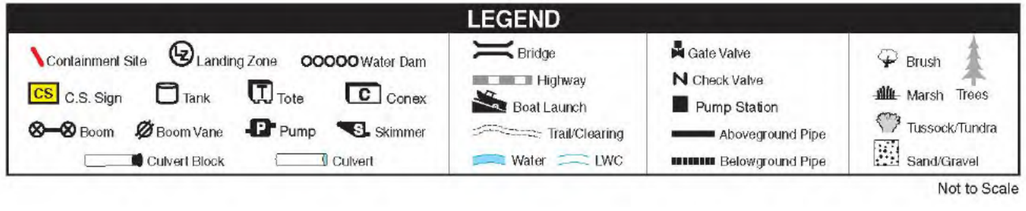
Tactics include booming / deflection along several locations on Prospect Creek.

Open ponds and back water areas are near the pullout for CS 5-3.

River Data	Staging Areas	Base Map Containment Sites	CS 5-4 Bonanza Creek
• Width = 20 - 100 ft. • Velocity = 1 - 3 ft./sec.	• 89 APL/AMS-4 • PS 5	CS 5-4 CS 5-7	C-Plan Map Ref. 28W Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Bonanza Creek CS 5-4

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Winter trail to Bonanza Creek intersection

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming and deflection	Booming and deflection
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
None	None

III. General Site Information

Water Path:	Water Variations:
Bonanza Creek flows west past the Dalton Highway, CS 5-4 is located approximately 10 river miles from the highway.	Drainage is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location:	**Forward Staging Area:**
Areas of opportunity exist, if needed	PS05

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to drainage from the site is clear.
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Fisheries resources in Bonanza Creek.

IV. General Site Description

Tactics include booming and deflection along several locations on Bonanza Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 5-6 Fish Creek
• Width = 20 - 50 ft. • Velocity = 1 - 3 ft./sec.	• PS 5 • 87 APL-4 • OMS 87-2B	**CS 5-6** CS 5-8 CS 5-9 CS 5-10 CS 5-12	C-Plan Map Ref. 29 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AFSC Lands/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Fish Creek CS 5-6

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access: (b) (7)(F), (b) (3)

Secondary Access: Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish storage and transfer operations at recovery sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s): Booming

Winter Response Tactic(s): Booming

Additional Containment Sites Above this Location: CS 5-9 CS 5-10 CS 5-12

Additional Containment Sites Below this Location: None

III. General Site Information

Water Path: Fish Creek flows west past the Dalton Highway. CS 5-6 is located at Fish Creek Bridge east of the highway. The pipeline is approximately 1.85 miles upstream from this site.

Water Variations: Fish Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location: East of the Dalton Highway, other areas of opportunity exist if needed

Forward Staging Area: PS05

Nearest Pump Station/Response Base: PS05

Response Equipment On Site (Kits and major items): None

Stream Bank Conditions at Site: Site has easy access

Vegetation Conditions at Site: Access to drainage from the site is clear

Location of Nearest Initial Helicopter Refueling Point: PS05

Utilize Additional Response Resources from: PS05

Communications Resources Available: ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Fisheries resource in Fish Creek

IV. General Site Description

Tactics include booming along several locations on Fish Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 5-7 Pung's Crossing Creek
• Width = 8 - 20 ft. • Velocity = 1 - 3 ft./sec.	• PS 5 • 89 APL/AMS-4	CS 5-4 **CS 5-7**	C-Plan Map Ref. 29, 30 Aerial Map Ref. 146, 147 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Pung's Crossing Creek — CS 5-7

I. Site Location

Location Description:	GPS Coordinates:
(b) (7)(F), (b) (3) (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Helicopter using the GPS coordinates

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish storage and transfer operations at recovery sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming	Booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 5-4 on Bonanza Creek

III. General Site Information

Water Path:	Water Variations:
Pung's Crossing Creek flows north to Bonanza Creek. Pipeline is approximately 1.29 miles upstream from this site.	The creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location:	Forward Staging Area:
East of the tributary, other areas of opportunity exist if needed	PS05, 89 APL/AMS-4

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access	Access to drainage from the site is clear

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Fisheries resource in Pung's Crossing and Bonanza Creeks.

IV. General Site Description

Tactics include booming along several locations on Pung's Crossing Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 5-8 Alder Mountain Creek
• Width = 3 - 5 ft. • Velocity = 1 - 4 ft./sec.	• 88 APL-1 • PS 5	CS 5-6 **CS 5-8** CS 5-9 CS 5-10 CS 5-12	C-Plan Map Ref. 29 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Alder Mountain Creek — CS 5-8

I. Site Location

(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates: (b) (7)(F), (b) (3) [redacted]

Primary Access:	**Secondary Access:**
Drive- on Dalton Highway	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	**Winter Response Tactic(s):**
Underflow / Water Dam C-Block	Underflow / Water Dam C-Block
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
None	None

III. General Site Information

Water Path:	**Water Variations:**
Alder Mountain Creek flows west to Fish Creek. Pipeline is approximately 1.86 miles upstream from this site.	Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location:	**Forward Staging Area:**
East of the Dalton Highway, other areas of opportunity exist if needed	PS05, 88 APL-1

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	**Vegetation Conditions at Site:**
Site has easy access	Access to drainage from the site is clear
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
PS05	PS05

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: Moose, fisheries resource in Pung's Crossing and Bonanza Creeks

IV. General Site Description

Tactics include booming along several locations on Alder Mountain Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 5-9 Kanuti River
• Width = 60 - 120 ft. • Velocity = 1 ft./sec.	• 86 AMS-4B • Old Man Airstrip • 86 APL/AMS-3A • 86 APL-4	CS 5-6 CS 5-8 **CS 5-9** CS 5-10 CS 5-12	C-Plan Map Ref. 30 Aerial Map Ref. 149 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Kanuti River CS 5-9

I. Site Location

Location Description:
Pipeline crossing of the Kanuti River

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive- via 86 APL-4

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Deflection and containment booming

Winter Response Tactic(s)
Booming
Snow berming
Ice slotting

Additional Containment Sites Above this Location:
CS 5-12

Additional Containment Sites Below this Location:
None close by

III. General Site Information

Water Path:
Several pipeline drainages enter the Kanuti River above this site.

Water Variations:
The river is susceptible to seasonal and rain influences. The surrounding area in this region is flat.

LZ Location:
At site on ROW

Forward Staging Area:
At site on ROW

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
One conex shared with CS 5-10

Stream Bank Conditions at Site:
Stable and defined
The area is open ground all along the bank

Vegetation Conditions at Site:
Minimal

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

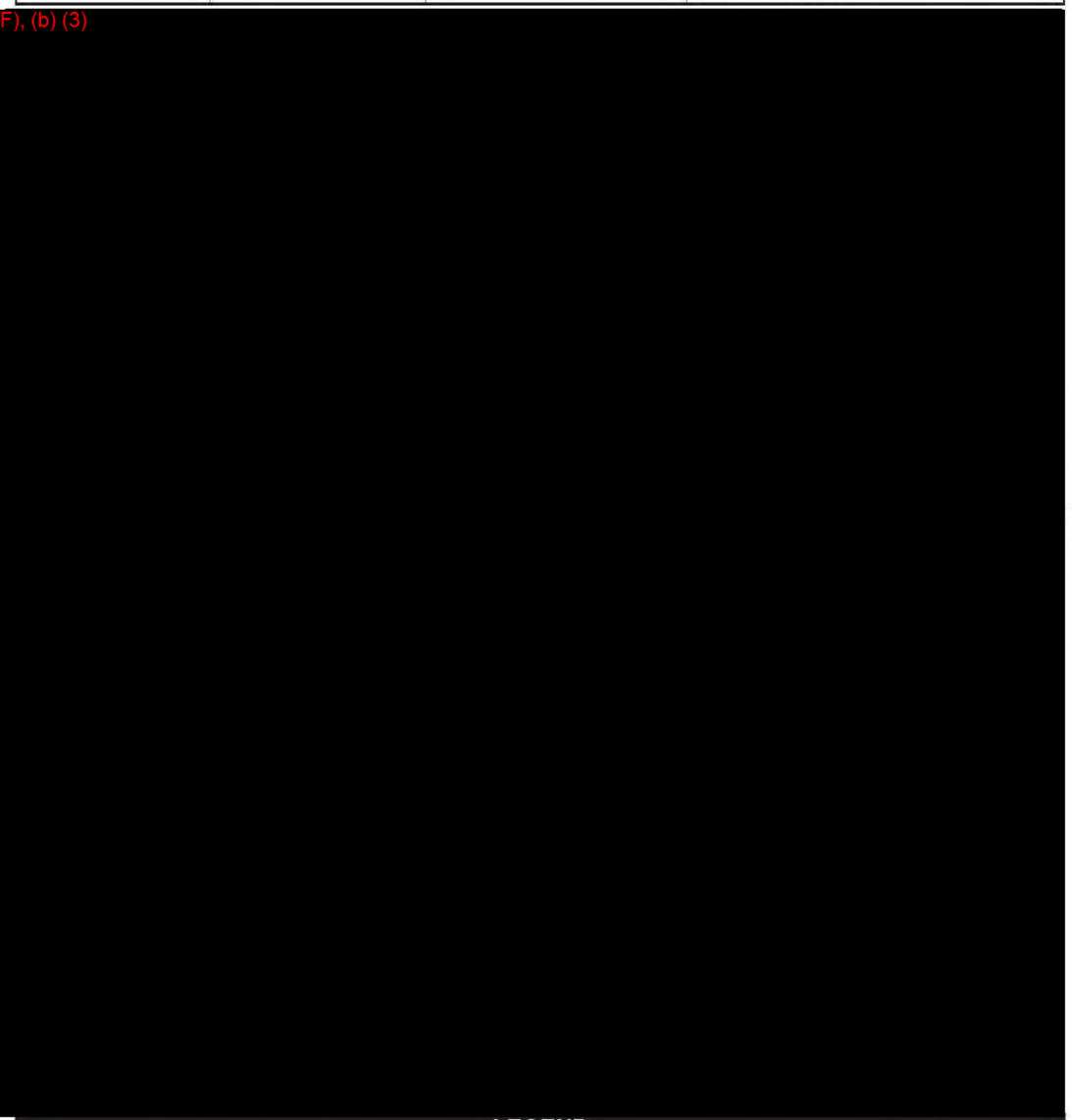
This site is on open ground with generally easy access on both sides of the river.

Several areas of opportunity are located downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 5-10 Unnamed Creek
• Width = 4 - 15 ft. • Velocity = 1 - 3 ft./sec.	• Work Pad near PLMP 303 • 86 APL/AMS-3A • PS 5	CS 5-6 **CS 5-10** CS 5-8 CS 5-12 CS 5-9	C-Plan Map Ref. 30 Aerial Map Ref. 149 (b) (7)(F), (b) (3) Contact AP-SC Landlord Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 5-10

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:
Drive- on ROW

Secondary Access:
Boat access from launch between (b) (7)(F), (b) (3)

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish storage and transfer operations at recovery sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Booming

Winter Response Tactic(s):
Booming
Ice slotting

Additional Containment Sites Above this Location:
CS 5-12

Additional Containment Sites Below this Location:
CS 5-6

III. General Site Information

Water Path:
Unnamed Creek flows south to the Kanuti River.

Water Variations:
The creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location:
East of the confluence of Unnamed Creek and the Kanuti River, other areas of opportunity exist if needed

Forward Staging Area:
PS05, 86 APL/AMS-3A. work pad (b) (7)(F),

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:
Site has easy access

Vegetation Conditions at Site:
Access to drainage from the site is clear

Location of Nearest Initial Helicopter Refueling Point:
PS05

Utilize Additional Response Resources from:
PS05

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: moose, bear, small game, fisheries resource in Unnamed Creek and the Kanuti River

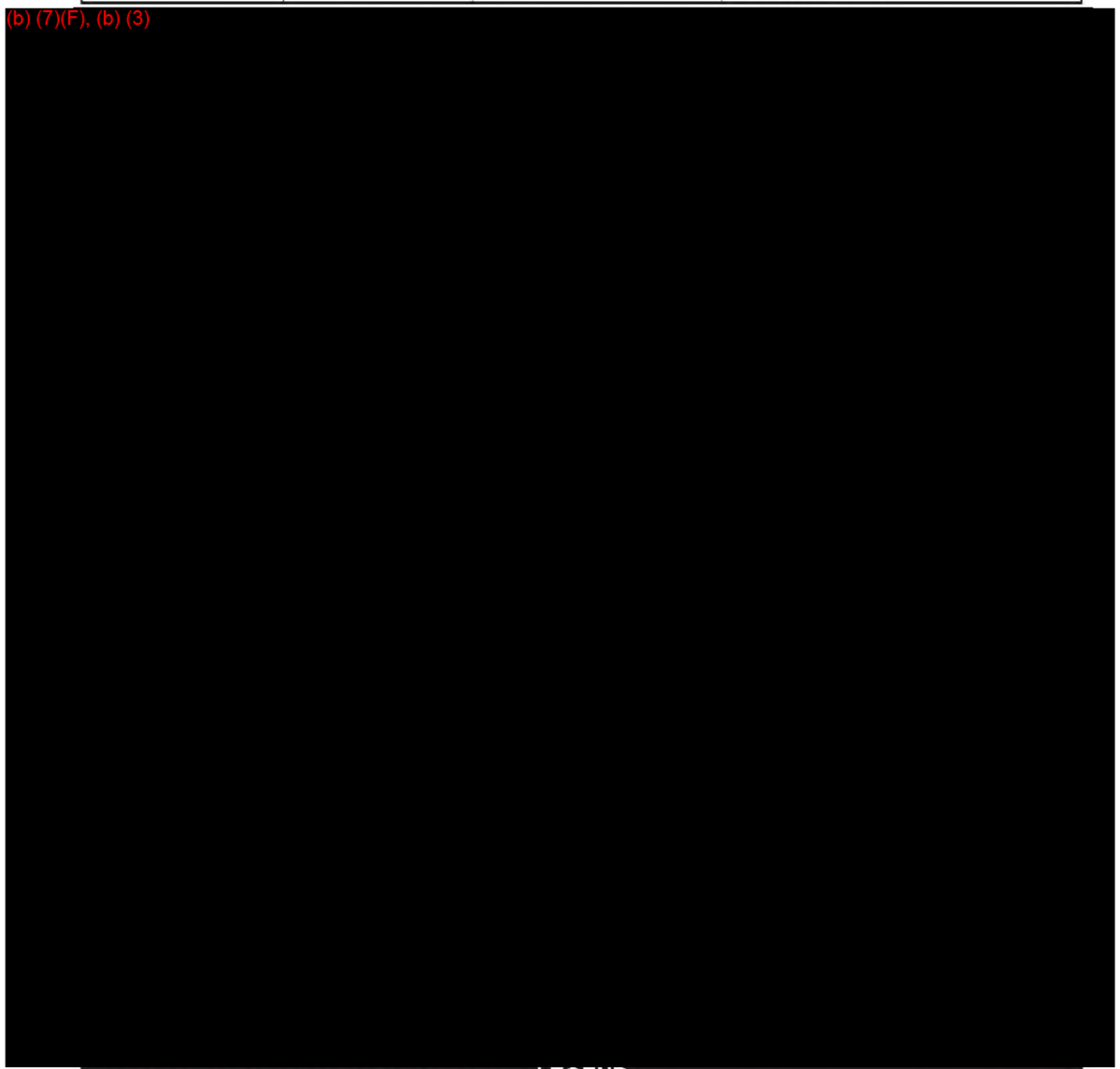
IV. General Site Description

Tactics include booming along several locations on Unnamed Creek as well as on the confluence of the Kanuti River and at downstream locations.

River Data	Staging Areas	Base Map Containment Sites	CS 5-12 Netsch's Creek
• Width = 10 - 50 ft. • Velocity = 1 - 3 ft./sec.	• PS 6 • 86 AMS-4B • 86 APL-4A	CS 5-6 CS 5-8 CS 5-9 CS 5-10 **CS 5-12**	C-Plan Map Ref. 30 Aerial Map Ref. 149 (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Netsch's Creek CS 5-12

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Confluence of Netsch's Creek with the Kanuti River	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Possible boat from the Kanuti River

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Booming Water dam	Ice slotting Booming in open channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 5-9

III. General Site Information

Water Path:	Water Variations:
Netsch's Creek parallels the pipeline above this site. The creek enters Kanuti River here.	The water speed is typically stable, but the creek is suscept ble to rain influences.
LZ Location:	**Forward Staging Area:**
At site- areas of opportunity are also nearby	86 APL/AMS-3A

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable with some cutbank Open bars on the river bends	Low brush
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
PS05	PS05

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, car bou, waterfowl

IV General Site Description

Many areas of opportunity are in this area.

River Data	Staging Areas	Base Map Containment Sites	CS 5-13 West Fork Dall River
• Width = 20 - 50 ft. • Velocity = 1 - 3 ft./sec.	• PS 6 • 84 APL-2	CS 5-13 CS 5-14	C-Plan Map Ref. 31, 31E Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

Containment Site | Landing Zone | Water Dam
CS C.S. Sign | Tank | T Tote | C Conex
Boom | Boom Vane | P Pump | S Skimmer
Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

West Fork Dall River — CS 5-13

I. Site Location

(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

Primary Access:	
Helicopter access using GPS coordinates	Boat access at high water levels

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming and diversion at areas of opportunity	Booming Ice slotting Oil may not enter this site in winter due to its distance from the pipeline

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 5-14 approximately 5 air miles downstream

III. General Site Information

Water Path:	Water Variations:
West Fork Dall River flows east away from the pipeline at this site.	River is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: South side of the West Fork Dall River, other areas of opportunity exist if needed	**Forward Staging Area:** PS06, 84 APL-2

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access Some cut bank areas One to four feet to water level	Access to drainage from the site is clear Brush and light trees in the area
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06

Communications Resources Available:
ARTS, VHF radio, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl

IV. General Site Description

Tactics include booming along several locations on West Fork Dall River.

New burn area is around the river at this site.

River Data	Staging Areas	Base Map Containment Sites	CS 5-14 West Fork Dall River
• Width = 10 - 60 ft. • Velocity = 1 - 3 ft./sec.	• 84 APL-1 • PS 6	CS 5-13 **CS 5-14**	C-Plan Map Ref. 31E Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

West Fork Dall River — CS 5-14

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Site is 5.2 air miles downstream of the confluence the Middle, South, and North Forks of the Dall River. The site is 8.3 air miles from the Pipeline.	N/A	N/A	(b) (7)(F), (b) (3) [redacted] ,

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming, MegaSecur water dam	Booming, MegaSecur water dam

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 5-13 approximately 5 air miles upstream	None

III. General Site Information

Water Path:	Water Variations:
West Fork Dall River flows east away from the pipeline to this last site.	River is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: South side of the West Fork Dall River, other areas of opportunity exist if needed	**Forward Staging Area:** PS06, 84 APL-1

Nearest Pump Station/Response Base: PS06

Response Equipment On Site (Kits and major items): None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access	Access to drainage from the site is clear
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06

Communications Resources Available: ARTS and VHF radio

Wildlife Sensitivities: Fisheries resource in West Fork Dall River

IV. General Site Description

Tactics include booming along several locations on West Fork Dall River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-15 Ray River
• Width = ?? - ?? ft. • Velocity = ?? - ?? ft./sec.	• PS 6	**CS 5-15** CS 5-24 CS 5-25 CS 5-26 CS 5-29	C-Plan Map Ref. 34 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Ray River

CS 5-15

I. Site Location

(b) (7)(F), (b) (3)

Location Description:		GPS Coordinates:
Site is east of the Dalton Highway just north of the confluence with the Yukon River. The site is 3.0 miles to the pipeline.	N N/ [redacted]	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming	Booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 5-24 is on Unnamed Creek #9 many oxbows upstream	None

III. General Site Information

Water Path:	Water Variations:
Ray River flows southeast to the Yukon River. This site is approximately three miles west of the pipeline.	River is subject to seasonal variation with light flow after break-up, slower flow in winter, or no flow.

LZ Location:	Forward Staging Area:
North side of Ray River, other areas of opportunity exist if needed	PS06

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS06	PS06

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Fisheries resource in Ray River

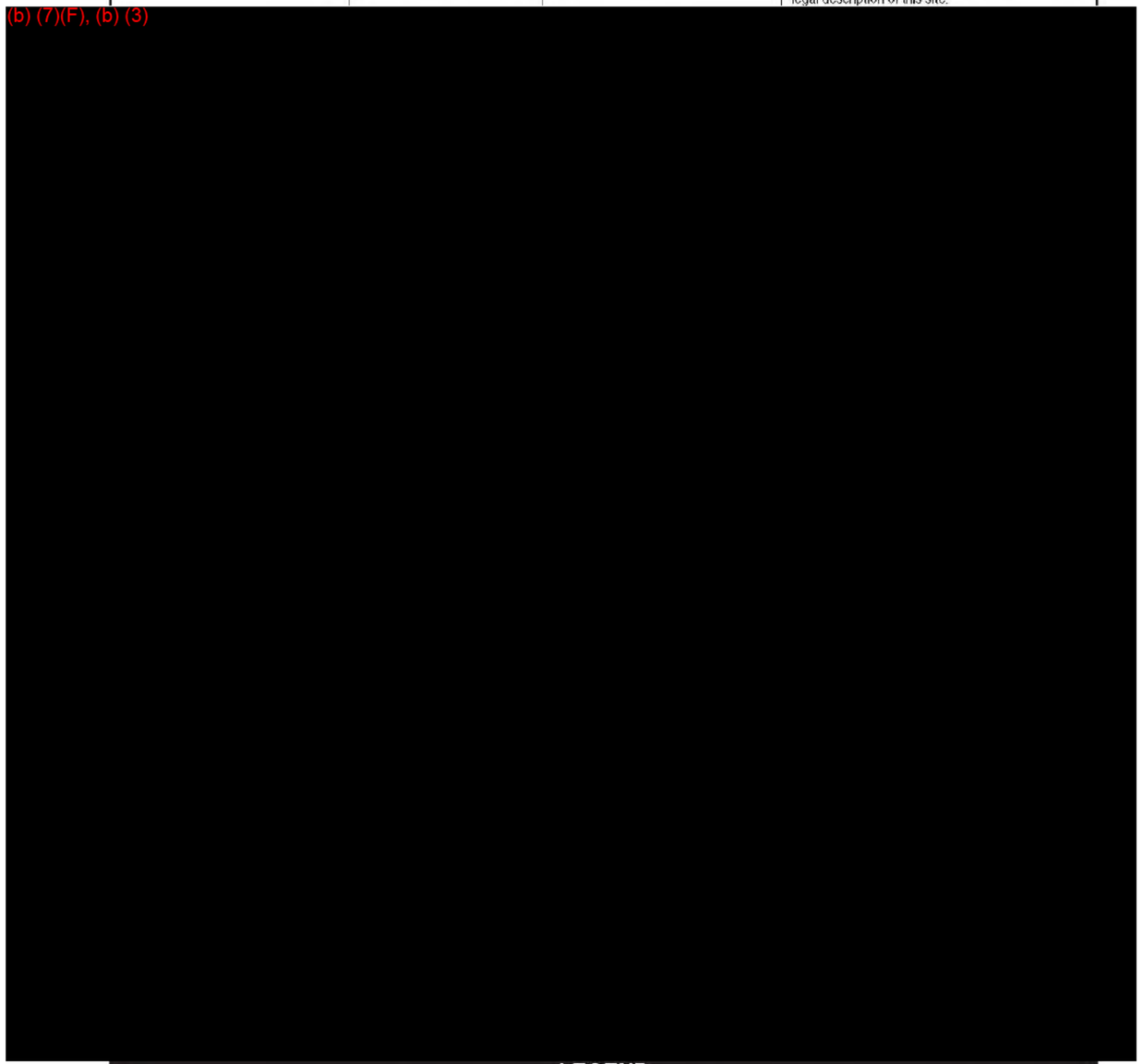
IV. General Site Description

Tactics include booming along several locations on Ray River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-16 North Fork Ray River
• Width = 30 ft. - 60 ft. • Velocity = 1 - 3 ft./sec.	• 80 APL-3A • 81 APL-1B • PS 6	**CS 5-16** CS 5-17 CS 5-18 CS 5-19 CS 5-20	C-Plan Map Ref. 33 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

North Fork Ray River — CS 5-16

I. Site Location

Location Description:	MP:	GPS Coordinates:
North Fork Ray River downstream of the pipeline (b) (7)(F), (b) (3)		(b) (7)(F), (b) (3)

Primary Access:	
Helicopter	Possible boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Booming in open channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 5-18 CS 5-20	None

III. General Site Information

Water Path:	Water Variations:
Several creeks cross the pipeline before entering the river upstream of this site.	The river water level is susceptible to seasonal and rain influences.
LZ Location:	**Forward Staging Area:**
At site and areas of opportunity	80 APL-3A

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat with a gentle slope to the water Some cut bank area on the river bends	Open - new and old burn areas
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
PS05	PS05

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: bear, moose, car bou

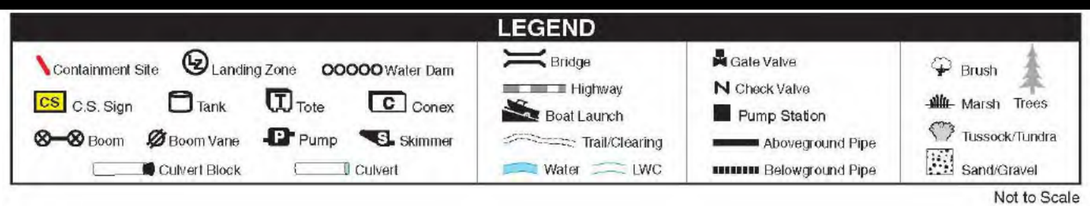
IV. General Site Description

There are new burn areas nearby, and several areas to divert and contain the oil.

The site is just above the confluence with the Ray River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-17 North Fork Ray River
• Width = 10 ft. - 30 ft. • Velocity = 2 - 4 ft./sec.	• OMS 82 • 82 AMS-0 • Work Pad near PLMP 329 • PS 6	CS 5-16 **CS 5-17** CS 5-18 CS 5-19 CS 5-20	C-Plan Map Ref. 32 Aerial Map Ref. 163, 164 (b) (7)(F), (b) (3) Contact APSC Land Dept for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

North Fork Ray River — CS 5-17

I. Site Location

Location Description:	(b) (7)(F), (b) (3)	GPS Coordinates:
Dalton Highway crossing of the North Fork Ray River		(b) (7)(F), (b) (3)
Primary Access: Drive on highway ROW		Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Booming and water dam at areas near the road way	Ice slotting Water dam in open areas
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 5-16

III. General Site Information

Water Path:	Water Variations:
North Fork of Ray River crosses under the pipeline above this site. It flows several miles downstream to CS 5-16.	Seasonal and rain influenced.
LZ Location: On the east side of the highway near the river crossing.	**Forward Staging Area:** 81 APL-4/OMS 82-0

Nearest Pump Station/Response Base:
PS05

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and flat around ROW.	Open and light areas around the site. Some trees on site.
Location of Nearest Initial Helicopter Refueling Point: PS05	**Utilize Additional Response Resources from:** PS05

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, caribou, bear, waterfowl

IV. General Site Description

There are many areas of opportunity along the upstream portion of this river.

River Data	Staging Areas	Base Map Containment Sites	CS 5-18 Ft. Hamlin Hills Creek
• Width = 5 ft. - 15 ft. • Velocity = 1 - 2 ft./sec.	• Work Pad near PLMP 336 • PS 6	CS 5-16 CS 5-17 **CS 5-18** CS 5-19 CS 5-20	C-Plan Map Ref. 33 Aerial Map Ref. 166, 167 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Fort Hamlin Hills Creek CS 5-18

I. Site Location

Location Description:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Drive.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Water Dam / booming

Winter Response Tactic(s):
Water Dam / booming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 5-20

III. General Site Information

Water Path:
Hamlin Hills Creek flows S/W to the Ray River. This site is approximately .7 river miles from the pipeline to the Dalton Bridge.

Water Variations:
Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location:
LZ is on the E side of the Dalton Highway and between the Highway and Hamlin Hills Creek, other areas of opportunity exist if needed.

Forward Staging Area:
Work Pad near (b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Fisheries resources in Hamlin Hills Creek and Ray River.

IV. General Site Description

Tactics include booming along several locations on Hamlin Hills Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 5-19 North Fork Ray River
• Width = 40 ft. - 100 ft. • Velocity = 1 - 4 ft./sec.	• PS 6 Response Base @ DHMP 53.9 • OMS 79-2@DHMP 64.5 • 7 Mile DOT Camp@DHMP 61.8	CS 5-16 CS 5-17 CS 5-18 **CS 5-19** CS 5-20	C-Plan Map Ref. 33 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

North Ray River — CS 5-19

I. Site Location

Location Description: Site is W of the Dalton Highway just N of the confluence with the Ray River. The site is 4.0 river miles to the Ray River.	(b) (7)(F), (b) (3) [redacted]	**GPS Coordinates:** (b) (7)(F), (b) (3) [redacted]
Primary Access: Helicopter access using GPS coordinates		Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s): Booming / Water Dam	**Winter Response Tactic(s):** Booming / Water Dam
Additional Containment Sites Above this Location: CS 5-17	**Additional Containment Sites Below this Location:** CS 5-16

III. General Site Information

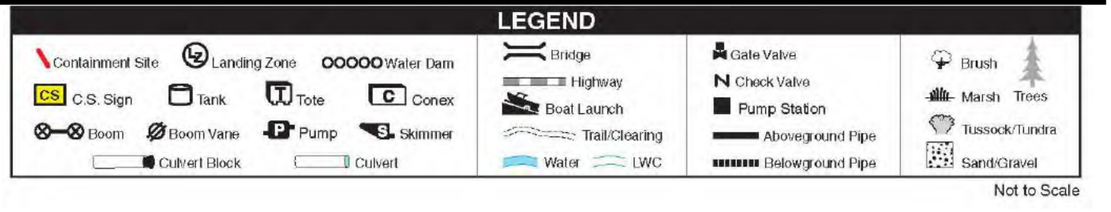
Water Path: North Fork Ray River flows N to the Ray River. This site is approximately 4 river miles to the river.	**Water Variations:** River is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: LZ is on the N side of Ray River, other areas of opportunity exist if needed	(b) (7)(F), (b) (3) [redacted]
Nearest Pump Station/Response Base: PS06	
Response Equipment On Site (Kits and major items): None	
Stream Bank Conditions at Site: Site has easy access.	**Vegetation Conditions at Site:** Access to drainage from the site is clear.
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06
Communications Resources Available: ARTS and VHF radio	
Wildlife Sensitivities: Fisheries resources in Ray River	

IV. General Site Description

Tactics include booming along several locations on North Fork Ray River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-20 Fort Hamlin Hills Cr.
• Width = 40 ft. - 100 ft. • Velocity = 1 - 4 ft./sec.	• PS 6 Response Base @ DHMP 53.9 • OMS 79-2@DHMP 64.5 • 7 Mile DOT Camp@DHMP 61.8	CS 5-16 CS 5-17 CS 5-18 CS 5-19 **CS 5-20**	C-Plan Map Ref. 33 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Fort Hamlin Hills Creek CS 5-20

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Site is at the confluence of the Ray River and Fort Hamlin Hills Creek.	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter access using GPS coordinates	Boat access

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water Dam / booming	Water Dam / booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 5-18	None

III. General Site Information

Water Path:	Water Variations:
Hamlin Hills Creek flows S/W to the Ray River. This site is approximately 1.75 river miles to the pipeline.	Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: LZ is on the N side of the Ray River, slightly upstream from the confluence with Fort Hamlin Hills Creek, other areas of opportunity exist if needed.	**Forward Staging Area:** (b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS06	PS06

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Fisheries resources in Hamlin Hills Creek and Ray River

IV. General Site Description

Tactics include booming along several locations on Ray River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-22 Unnamed Creek #6
• Width = 30 - 100 ft. • Velocity = 1 - 4 ft./sec.	• 79 APL/AMS-2 • 79 APL-3	CS 5-20 CS 5-22	C-Plan Map Ref. 34 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale 10/2013

Alyeska pipeline SERVICE COMPANY

Unnamed Creek #6 — CS 5-22

I. Site Location

Location Description:
Site is on the Ray River downstream from Unnamed Creek #6.

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter access using GPS coordinates

Secondary Access:
Seasonal boat access (high water)

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
MegaSecur Dam / booming

Winter Response Tactic(s):
Ice Trenching

Additional Containment Sites Above this Location:
CS 5-20

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Unnamed Creek #6 flows S/W to the Ray River. This site is approximately 19.75 river miles from the Yukon River.

Water Variations:
Creek is subject to seasonal variation with light flow after break-up, slower flow in winter, or no flow.

LZ Location:
LZ is on the N side of the Ray River; other areas of opportunity exist if needed.

Forward Staging Area:
79 APL-3, 79 APL/AMS-2

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
ARTS and VHF radio

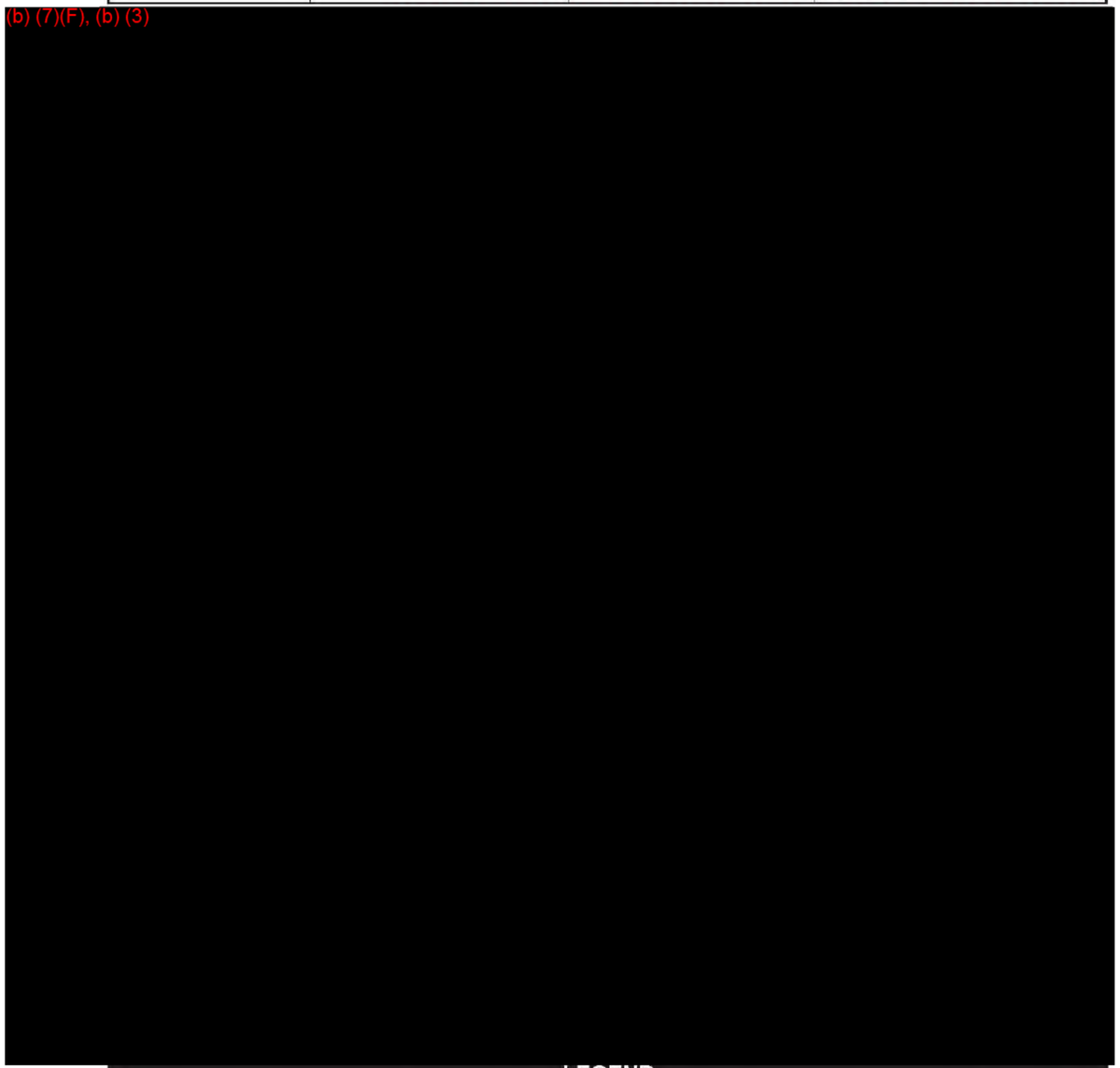
Wildlife Sensitivities: Fisheries resources in Unnamed Creek #6 and Ray River

IV. General Site Description

Tactics include booming along several locations on the oxbows and the Ray River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-24 Unnamed Cr. #9
• Width = 2 - 6 ft. • Velocity = 1 - 3 ft./sec.	• PS 6 • 5 Mile Camp	CS 5-15 **CS 5-24** CS 5-25 CS 5-26 CS 5-29	C-Plan Map Ref. 34 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek #9 — CS 5-24

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Site is at the confluence of Unnamed Creek #9 and the Ray River.

GPS Coordinates:
(b) (7)(F), (b) (3),

Primary Access:
Helicopter access using GPS coordinates

Boat access via the Ray River.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Underflow / Water Dam booming

Winter Response Tactic(s):
Underflow / Water Dam booming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 5-15

III. General Site Information

Water Path:
Unnamed Creek #9 flows S/W to the Ray River. This site is approximately 7.5 river miles from the Yukon River.

Water Variations:
Creek is subject to seasonal variation with light flow after break-up, slower flow in winter, or no flow.

LZ Location:
LZ is on the N side of the Ray River, upstream from the confluence of the Ray River and Unnamed Creek #9, other areas of opportunity exist if needed.

Forward Staging Area:
PS06, 5 Mile Camp

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Underflow Dam Kit, Sandbag Kit

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
ARTS and VHF radio

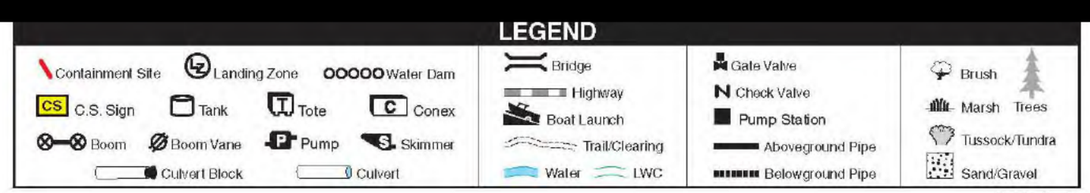
Wildlife Sensitivities: Fisheries resources in Unnamed Creek #9 and Ray River

IV. General Site Description

Tactics include booming along several locations on Unnamed Creek #9 that flows into the Ray River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-25 Woodchopper Creek
• Width = 6 - 10 ft. • Velocity = 0 - 2 ft./sec.	• PS 6 Response Base • 5 Mile Camp • RGV 60 • 78 APL-1	CS 5-15 CS 5-24 **CS 5-25** CS 5-26 CS 5-29	C-Pan Map Ref. 34 Aerial Map Ref. 175 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline

Woodchopper Creek — CS 5-25

I. Site Location

Location Description:
Culvert site is at the junction of Woodchopper Creek and the Dalton Highway.

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Dalton Highway	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow / C-Block Water Dam	Underflow / C-Block Water Dam booming
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
Woodchopper Creek flows S/W to the Yukon River.	Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.
LZ Location: LZ is on the S side of the Dalton Highway, other areas of opportunity exist if needed.	**Forward Staging Area:** PS06 Response Base, 5 Mile Camp, RGV 60, 78 APL-1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Site has easy access.	Access to drainage from the site is clear.
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Fisheries resources in Woodchopper Creek and the Yukon River

IV. General Site Description

Tactics include booming along several locations on Woodchopper Creek that flows into the Yukon River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-26 Burbot Creek
• Width = 1 - 3 ft. • Velocity = 1 - 3 ft./sec.	• PS 6 • 78 APL-1	CS 5-15 CS 5-25 **CS 5-26** CS 5-28 CS 5-29	C-Plan Map Ref. 34 Aerial Map Ref. 175, 176 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Burbot Creek

CS 5-26

I. Site Location

Location Description:
Culvert site is at the junction of Burbot Creek and the Dalton Highway.

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Dalton Highway

Secondary Access:
Drive.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
C-Block Water Dam

Winter Response Tactic(s):
C-Block Water Dam booming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Burbot Creek flows S/W to the Yukon River. Pipeline is approximately .75 river miles upstream.

Water Variations:
Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location:
LZ is on the Dalton Highway.

Forward Staging Area:
PS06, 78 APL-1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Fisheries resources in Burbot Creek and the Yukon River

IV. General Site Description

Tactics include booming along several locations on Burbot Creek that flows into the Yukon River.

River Data	Staging Areas	Base Map Containment Sites	CS 5-29 Unnamed Drainage
• Width = 3 - 8 ft. • Velocity = 1 - 3 ft./sec.	• PS 6	CS 5-15 CS 5-24 CS 5-25 CS 5-26 **CS 5-29**	C-Plan Map Ref. 34 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Drainage — CS 5-29

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Site is at the confluence of unnamed Drainage and the Yukon River.

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter using GPS coordinates

Secondary Access:
Boat access from launch at 79 APL-1A

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):
Underflow / Water Dam

Winter Response Tactic(s):
Underflow / Water Dam

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Unnamed Drainage flows W to the Yukon River. Pipeline is approximately 1.5 river miles upstream.

Water Variations:
Creek is subject to seasonal variation with light flow after break-up, slower frozen water conditions in winter, or no flow.

LZ Location:
LZ is on the S side of Unnamed Drainage.

Forward Staging Area:
PS06

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Underflow Dam Kit, Sandbag Kit

Stream Bank Conditions at Site:
Site has easy access.

Vegetation Conditions at Site:
Access to drainage from the site is clear.

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
ARTS and VHF radio

Wildlife Sensitivities: Fisheries resources in Unnamed Drainage and the Yukon River

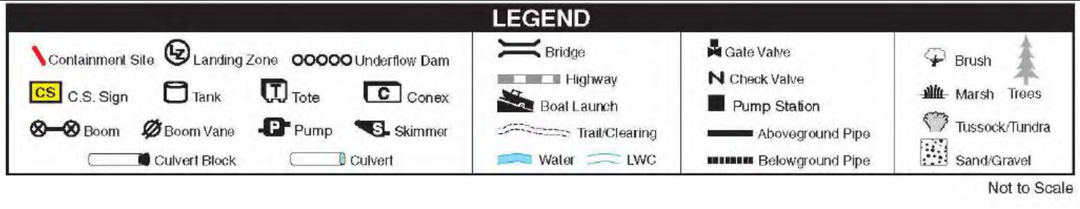
IV. General Site Description

Tactics include Underflow / Water Dam along several locations on Unnamed Drainage that flows into the Yukon River.

River Data	Staging Areas	Base Map Containment Sites	CS 6-2 Isom Creek
• Width = 10 ft. - 30 ft. • Velocity = 1 - 3 ft./sec.	• PS 6 • OMS 76-2.1	CS 6-2 CS 6-4	C-Plan Map Ref. 35W Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Isom Creek — CS 6-2

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Confluence of Isom Creek and Yukon River	N/A	N/A	(b) (7)(F), (b) (3) ,

Primary Access:	Secondary Access:
Helicopter	Boat - via Yukon River

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Establish storage and transfer operations at recovery sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming Possible use of water dam at low water levels	Booming or water dam Oil may not migrate this far in winter

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 6-4	None

III. General Site Information

Water Path:	Water Variations:
Isom Creek and miscellaneous drainages cross the pipeline above this site. Site is at Yukon River confluence.	The creek is suscept ble to seasonal and rain influences. Yukon River will back flow up into this site.
LZ Location: At site near the confluence of Isom Creek and the Yukon River	**Forward Staging Area:** OMS 76-2.1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Sorbent boom, Boom, Portable Megasecur Dam stored at YRB

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Very steep Mud and loose soils	Forested Site is grass with brush fringe
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06

Communications Resources Available:
CB local, satellite phone

Wildlife Sensitivities: moose, bear, small game, waterfowl

IV. General Site Description

This site is approximately 100 yards upstream of the confluence of Isom Creek and the Yukon River.

Access to the creek from the bank may require a ladder at low water.

Mud banks are ten to twenty feet high.

Other areas of opportunity are located upstream.

River Data	Staging Areas	Base Map Containment Sites	CS 6-4 Unnamed Creek
• Width = 3 - 20 ft. • Velocity = 1 - 5 ft./sec.	• PS 6 • OMS 76-2.1	CS 5-29 CS 6-2 **CS 6-4**	C-Plan Map Ref. 35 Aerial Map Ref. 181 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 6-4

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Confluence of Unnamed Creek and Isom Creek.	N/A	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water dam May use small boom sets at higher water levels	Water dam in open areas Oil may not enter this site in winter

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 6-2

III. General Site Information

Water Path:	Water Variations:
Unnamed Creek flows under the pipeline above this site. The creek flows into Isom Creek which flows into the Yukon River.	This creek is susceptible to influences from Spring break-up and rain.

LZ Location:	Forward Staging Area:
At site	OMS 76-2.1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom, ATV with Trailer Stored at YRB, Sandbags, Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Flat Some wetlands in the area One- to three-foot bank at normal water levels	Open area with small stands of spruce

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS06	PS06

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, eagle, waterfowl

IV. General Site Description

This site lies at the base of steep hills on open ground.

River Data	Staging Areas	Base Map Containment Sites	CS 6-6 Hess Creek
• Width = 50 ft. - 150 ft. • Velocity = 1 - 5 ft./sec.	• OMS 74-2R • CS 6-11D • 73 APL-1/Work Pad	CS 6-6 CS 6-11C	C-Plan Map Ref. 35 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale • 10/2013

Alyeska pipeline service company

Hess Creek — CS 6-6

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Hess Creek	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat- access near CS 6-11B

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy deflection boom to divert oil to containment and recovery areas.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming Possible use of water dam in low channels	Ice slotting Containment booming in open channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 6-11A CS 6-11B CS 6-11C CS 6-11D CS 6-12 CS 6-13	CS 6-2

III. General Site Information

Water Path:	Water Variations:
Hess Creek and several small drainages flow under the pipeline. Hess Creek enters the Yukon River.	Water levels in the creek are generally stable, although they are susceptible to influences from Spring runoff and rain.
LZ Location: At site on gradual bend in the river's west side	**Forward Staging Area:** OMS 76-2.1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Sorbent Boom Tote located at OMS 7-2

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gradual bank, gravel/mud bar at normal water level.	Forested Site is groomed on the west side
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

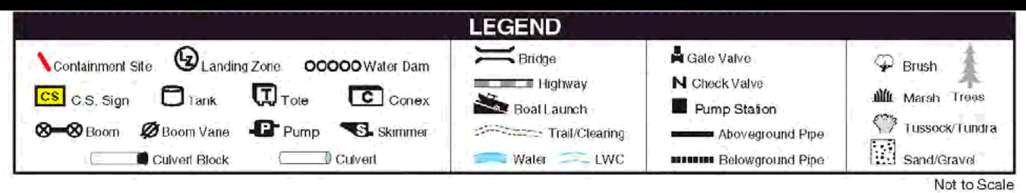
IV. General Site Description

Bank is gradual with gravel/mud bar at normal to low water level.

Another area of opportunity is located downstream of this site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-11A Hess Creek
• Width = 3 - 5 ft. • Velocity = 2 - 6 ft./sec.	• OMS 74-2R • CS 6-11D • 73 APL-1/Work Pad	**CS 6-11A** CS 6-11B CS 6-11D CS 6-12 CS 6-13 CS 6-15 CS 6-16 CS 6-19	C-Plan Map Ref. 36 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Hess Creek CS 6-11A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Confluence of Hess Creek and Unnamed Creek	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat- from 6-11B to the bluff just below

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water dam	Water dam Oil may not enter this site in winter

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 6-2, CS 6-13

III. General Site Information

Water Path:	Water Variations:
Creek flows under the pipeline above this site and flows into Hess Creek below this site.	The creek is suscept ble to rain influences but is usually two to three feet deep.

LZ Location:	Forward Staging Area:
At site on bluff above Hess Creek	N/A

Nearest Pump Station/Response Base:

PS06

Response Equipment On Site (Kits and major items):

2 Auxiliary Conexes, Boom, Sandbags, Tundra Liner

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
The creek is at the bottom of a steep but walkable gulley.	Trees with moderate brush Dead fall over the creek

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS06	N/A

Communications Resources Available:

VHF, satellite phone

Wildlife Sensitivities: bear, eagle, small game

IV. General Site Description

Site is on a steep bluff above Hess Creek.

There are several pockets and access areas upstream of the site.

Additional materials are at CS6-13 which is across Hess Creek from this site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-11B Hess Creek
• Width = 50 - 100 ft. • Velocity = 2 - 5 ft./sec.	• 73-APL-1 / ROW	CS 6-11A **CS 6-11B** CS 6-11D CS 6-12 CS 6-13 CS 6-15 CS 6-16 CS 6-19	C-Plan Map Ref. 36 Aerial Map Ref. 191 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Not to Scale

Alyeska pipeline SERVICE COMPANY

Hess Creek — CS 6-11B

(b) (7)(F), (b) (3)

[redacted]

I. Site Location

Location Description: Pipeline crossing of Hess Creek	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Drive on Dalton Highway to 73 APL-1	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s): Diversion and containment booming	**Winter Response Tactic(s)** Ice slotting Containment booming in open channels
Additional Containment Sites Above this Location: CS 6-19	**Additional Containment Sites Below this Location:** CS 6-2, CS 6-11D, CS 6-13

III. General Site Information

Water Path: Hess Creek flows under the pipeline at this point.	**Water Variations:** Hess Creek is generally stable but is suscept ble to seasonal and rain influences.
LZ Location: At ROW intersection with 73 APL-1	**Forward Staging Area:** N/A

Nearest Pump Station/Response Base: PS06

Response Equipment On Site (Kits and major items): 1 Standard Conex, 2 Auxiliary Conexes, Boom

Stream Bank Conditions at Site: Stable Open gravel bars both up and downstream	**Vegetation Conditions at Site:** Forested Moderate brush along the bank
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06PS06

Communications Resources Available: VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl

IV General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 6-11C Hess Creek
• Width = 100 - 150 ft. • Velocity = 2 - 5 ft./sec.	• OMS 74-2R • CS 6-11D • 73 APL-1/Work Pad	CS 6-6 **CS 6-11C**	C-Plan Map Ref. 35WA Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Hess Creek — CS 6-11C

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Hess Creek	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat- downstream pipeline crossing

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Boom in open leads

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 6-6	CS 6-11A	CS 6-2
CS 6-11C	CS 6-11D	
CS 6-12	CS 6-19	
CS 6-15	CS 6-16	

III. General Site Information

Water Path:	Water Variations:
Hess Creek flows under the pipeline and into the Yukon River.	Hess Creek is susceptible to seasonal and rain influences.

LZ Location:	Forward Staging Area:
At site	N/A

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Mud and soil with a two to four-foot drop to the water	Forested Site is in a brush area that has been cleared

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS06	PS06

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, eagle, waterfowl

IV. General Site Description

Site is on the north bank in an open area.

Areas of opportunity are located up and downstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-11D Hess Creek
• Width = 50- 100 ft. • Velocity = 2 - 5 ft./sec.	• OMS (private) CS 6-11D • 73 APL-1/ROW	CS 6-11A CS 6-11B **CS 6-11D** CS 6-12 CS 6-13 CS 6-15 CS 6-16 CS 6-19	C-Plan Map Ref. 36 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AK SC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Hess Creek CS 6-11D

I. Site Location

Location Description:	(b) (7)(F), (b) (3)	GPS Coordinates:
Hess Creek		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive, site is at the old gravel pit	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Diversion and containment booming in open channels

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:	
CS 6-11B	CS 6-15	CS 6-13	CS 6-2
CS 6-16	CS 6-19		

III. General Site Information

Water Path:	Water Variations:
Hess Creek flows under the pipeline just above this site. It eventually flows into the Yukon River downstream.	Hess Creek is susceptible to seasonal and rain influences.
LZ Location: At the far end of the gravel pit	**Forward Staging Area:** At the site

Nearest Pump Station/Response Base:

PS06

Response Equipment On Site (Kits and major items):

1 Enhanced Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Bank is three feet to five feet above water at normal water levels	Forested Open trails and access to the creek
Location of Nearest Initial Helicopter Refueling Point: PS06	**Utilize Additional Response Resources from:** PS06

Communications Resources Available:

VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Site is in the old gravel pit on the north side of Hess Creek.

The pond could poss bly be used as secondary storage site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-12 Unnamed Creek
• Width = 3 - 10 ft. • Velocity = 1 - 3 ft./sec.	• OMS 74-2R • CS 6-11D • 73 APL-1/Work Pad	CS 6-11A CS 6-11B CS 6-11D **CS 6-12** CS 6-13 CS 6-15 CS 6-16 CS 6-19	C-Plan Map Ref. 35, 36 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 6-12

I. Site Location

(b) (7)(F), (b) (3)

[redacted]

Location Description:	GPS Coordinates:
Just above the confluence of Unnamed Creek and Hess Creek	(b) (7)(F), (b) (3) ,

Primary Access:	Secondary Access:
Helicopter	Boat- downstream to confluence on Hess Creek

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water dam Booming at high water levels	Booming and water dam Oil may not reach this site in winter

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 6-2

III. General Site Information

Water Path:	Water Variations:
Unnamed Creek flows into Hess Creek at this site. Hess Creek flows into the Yukon.	The creek is suscept ble to rain influences.

LZ Location:	Forward Staging Area:
At site on the south side of the creek	OMS 74-2HR

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable and flat One foot to three feet drop to normal water level	Small spruce in wet/bog area Forest around the site

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS06	PS06

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

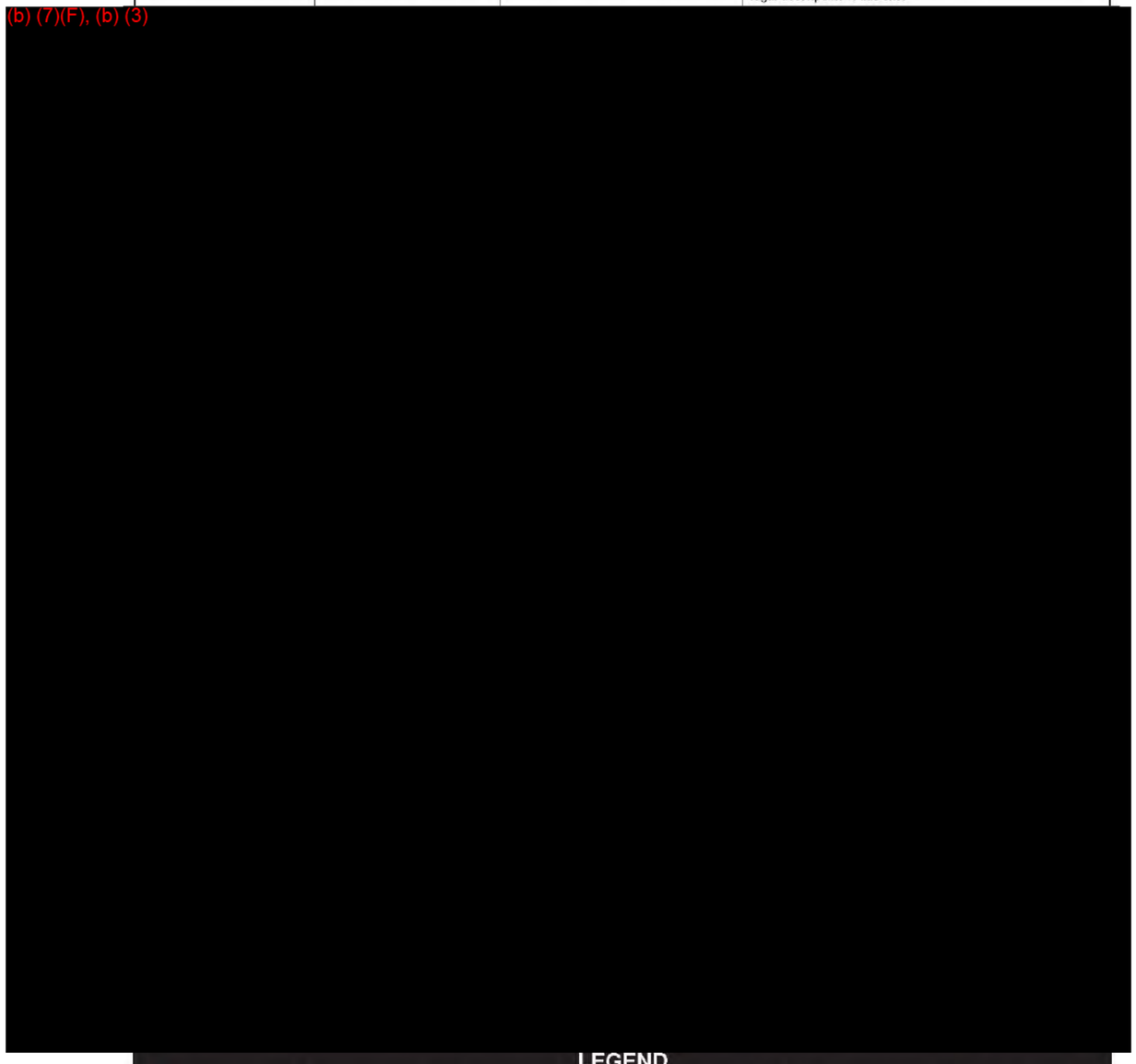
Site is well defined in the trees.

Creek is channeled and defined.

River Data	Staging Areas	Base Map Containment Sites	CS 6-13 Unnamed Creek
• Width = 50 - 70 ft. • Velocity = 2 - 5 ft./sec.	• OMS 74-2R • CS 6-11D • 73 APL-1/Work Pad	CS 6-11A CS 6-11B CS 6-11D CS 6-12 **CS 6-13** CS 6-15 CS 6-16 CS 6-19	C-Plan Map Ref. 36 Aerial Map Ref. N/A (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 6-13

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Hess Creek below CS 6-11A

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Boat- downstream of CS 6-11B

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Diversion and containment booming

Winter Response Tactic(s)
Ice slotting
Booming in open channels

Additional Containment Sites Above this Location:
CS 6-11B CS 6-11D
CS 6-15 CS 6-16
CS 6-19

Additional Containment Sites Below this Location:
CS 6-2

III. General Site Information

Water Path:
Hess Creek flows under the pipeline and into the Yukon River.

Water Variations:
Hess Creek is susceptible to rain and seasonal influences.

LZ Location:
At the site

Forward Staging Area:
OMS 74-2HR

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
2 Auxiliary Conexes, Plywood, Sandbags

Stream Bank Conditions at Site:
Stable and flat
One foot to four feet drop to normal water at normal levels

Vegetation Conditions at Site:
Light spruce trees
Open walking

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

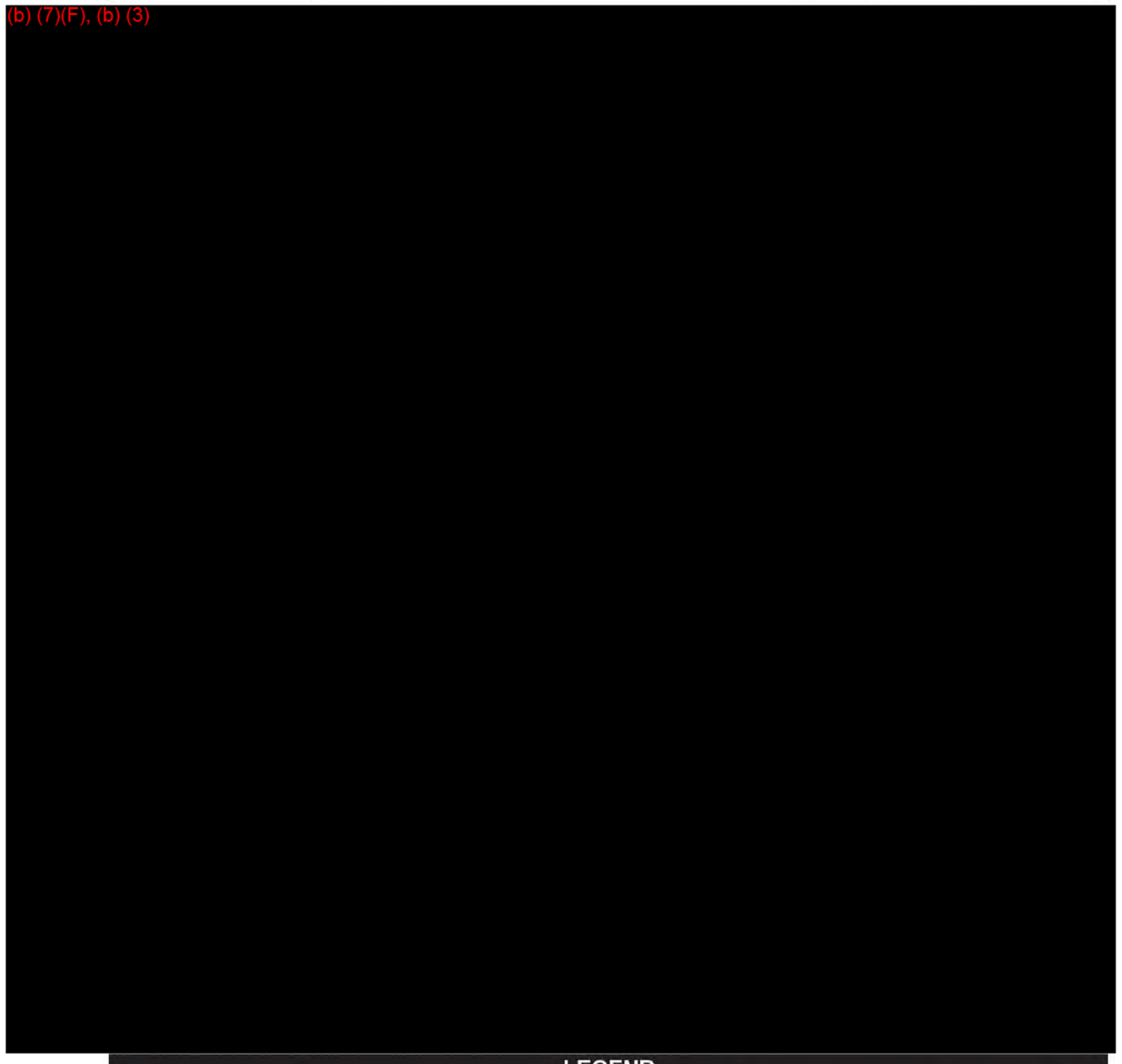
IV. General Site Description

Site is on opposite bank and below CS 6-11A, and it can support CS 6-11A or confluence of the unnamed creek and Hess Creek.

Areas of opportunity are located up and downstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-15 Mastadon Creek
• Width = 5 - 25 ft. • Velocity = 1 - 5 ft./sec.	• RGV 62 • 73 APL-1/Work Pad • CS 6-11D	CS 6-11A CS 6-11B CS 6-11D CS 6-12 CS 6-13 **CS 6-15** CS 6-16 CS 6-19	C-Plan Map Ref. 36 Aerial Map Ref. 190, 191 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Mastadon Creek — CS 6-15

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Confluence of Mastodon Creek and Hess Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Walk in- site is a quarter mile off the work pad

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):
Water dam and containment booming

Winter Response Tactic(s)
Ice slotting
Booming in open areas

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 6-11D CS 6-2
CS 6-13

III. General Site Information

Water Path:
Mastodon Creek flows near and under the pipeline before entering Hess Creek.

Water Variations:
Mastodon Creek is normally stable but is susceptible to seasonal and rain influences.

LZ Location:
At the site

Forward Staging Area:
On the work pad near the creek crossing

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable soils
Some sandy or cut bank areas

Vegetation Conditions at Site:
Forested
Trails and access to creek are established

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, eagle

IV. General Site Description

Site is just upstream of the Hess Creek and Mastodon Creek confluence.

There are numerous sand bars and access sites in this area.

River Data	Staging Areas	Base Map Containment Sites			CS 6-16 Fish Creek
• Width = 10 - 20 ft. • Velocity = 1 - 5 ft./sec.	• CS 6-11D • 73 APL-1/Work Pad	CS 6-11A CS 6-12 **CS 6-16**	CS 6-11B CS 6-13 CS 6-19	CS 6-11D CS 6-15	C-Plan Map Ref. 36 Aerial Map Ref. 190, 191 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · CS C.S. Sign · Tank · T Tote · C Conex · Boom · Boom Vane · P Pump · S Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · N Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Fish Creek CS 6-16

I. Site Location

Location Description:
Confluence of Fish Creek and Hess Creek

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Walk in- site is approximately 100 yards off ROW

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Diversion and containment booming on Hess Creek
Water dam at Fish Creek outlet

Winter Response Tactic(s)
Booming in open channels on Hess Creek
Water dam at Fish Creek outlet

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 6-11D CS 6-13
CS 6-2

III. General Site Information

Water Path:
Fish Creek flows into Hess Creek.

Water Variations:
Fish Creek is susceptible to rain influences.

LZ Location:
At the site on Hess Creek side of the confluence

Forward Staging Area:
73 APL-1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Portable MegaSecur Dam

Stream Bank Conditions at Site:
Stable soils
Some mud banks with three to five-foot slopes to the water at normal levels

Vegetation Conditions at Site:
Forested
Side is on open bend in Hess Creek

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
VHF, satellite phone, ARTS

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Actual site is on Hess Creek.

Two small drainage areas combine at creek confluence and flow into Hess Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 6-19 Hess Creek
Hess Creek • Width = 50 - 75 ft. • Velocity = 2 - 5 ft./sec. **Erickson Creek:** Width = 10 ft. - 20 ft. • Velocity = 1 - 3 ft./sec.	• 73 APL-1/Work Pad • RGV-62	CS 6-11A CS 6-11B CS 6-11D CS 6-12 CS 6-13 CS 6-15 CS 6-16 **CS 6-19**	C-Plan Map Ref. 36 Aerial Map Ref. 192 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Hess Creek CS 6-19

I. Site Location

Location Description:
Just down Hess Creek from Erickson Creek (b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Boat- upstream from CS 6-11B

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Deflection and containment booming

Winter Response Tactic(s)
Ice slotting
Booming in open areas

Additional Containment Sites Above this Location:
CS 6-23 CS 6-24
CS 6-25

Additional Containment Sites Below this Location:
CS 6-11B CS 6-11D
CS 6-2 CS 6-13

III. General Site Information

Water Path:
Oil would enter this site from Erickson Creek.
Hess Creek flows to the Yukon River.

Water Variations:
The creeks are suscept ble to seasonal and rain influences.

LZ Location:
At the site

Forward Staging Area:
73 APL-1

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable soil
Two- to four-foot drop to water level
Some cut banks

Vegetation Conditions at Site:
Forested
Groomed site area
Some fire kill in the area

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06 CS 6-11B

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, eagle, waterfowl

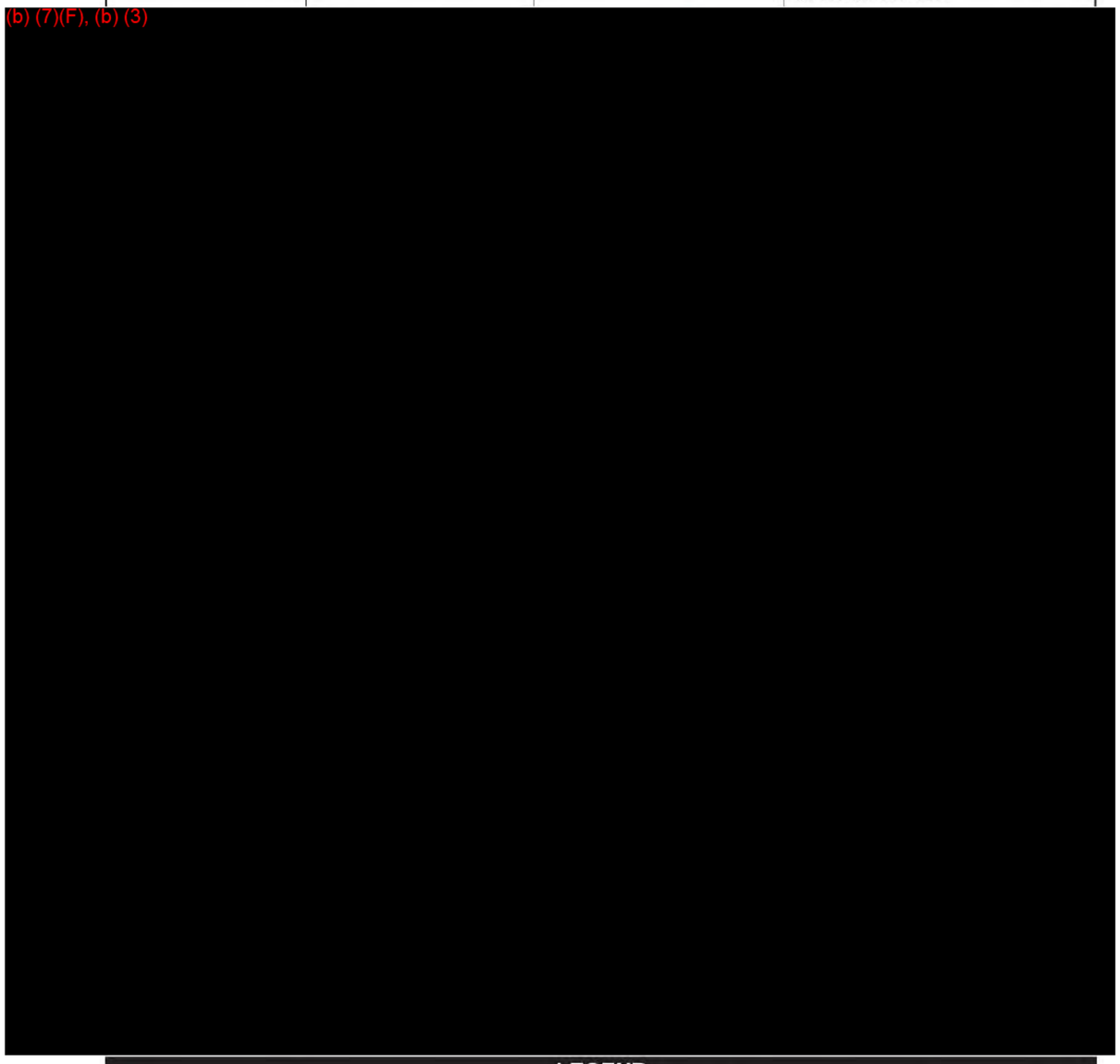
IV. General Site Description

This site is on Hess Creek, just downstream from Erickson Creek.

Trails and areas of opportunity are located on Erickson Creek.

River Data	Staging Areas	Base Map Containment Sites	CS 6-23 Erickson Creek #2
• Width = 10 ft. - 40 ft. • Velocity = 1 - 3 ft./sec.	• OMS 73-1R • 73 APL-1/Work Pad • OMS 72-1	CS 6-23 CS 6-24 CS 6-25	C-Plan Map Ref. 36 Aerial Map Ref. 107 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Erickson Creek #2 — CS 6-23

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Pipeline crossing of Erickson Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive, ROW accessible

Secondary Access:
Helicopter to ROW

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Boom at areas of opportunity with water dam at low water levels

Winter Response Tactic(s)
Snow berm
Water dam
Ice slotting

Additional Containment Sites Above this Location:
CS 6-24 CS 6-25

Additional Containment Sites Below this Location:
CS 6-11B CS 6-11D
CS 6-13 CS 6-2

III. General Site Information

Water Path:
Erickson Creek flows into Hess Creek.
Hess Creek flows into the Yukon.

Water Variations:
Tactics are variable at the site when water level is high.

LZ Location:
On ROW at site

Forward Staging Area:
On ROW at the site

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Portable MegaSecur Dam

Stream Bank Conditions at Site:
Stable
Cut bank with 2'-5' to water at normal levels

Vegetation Conditions at Site:
Heavy vegetation
Forest around the site

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, eagle, waterfowl

IV General Site Description

Site is ROW bridge crossing of Erickson Creek.

Other sites of opportunity are located downstream.

The area behind the tree line along the stream is easily walkable.

River Data	Staging Areas	Base Map Containment Sites	CS 6-24 Erickson Creek #1
• Width = 10 ft. - 40 ft. • Velocity = 1 - 5 ft./sec.	• OMS 72-1 • OMS 73-1R • 73 APL-1/ROW	CS 6-23 **CS 6-24** CS 6-25	C-Plan Map Ref. 36 Aerial Map Ref. 194, 195 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Trees | Marsh | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Erickson Creek #1 CS 6-24

I. Site Location

Location Description:
Pipeline crossing of Erickson Creek (b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive, ROW accessible

Secondary Access:
Helicopter to ROW

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Establish containment at sites where oil recovery, storage and transport can be optimized.
Ensure responder safety through the use of site specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Containment booming and water dam

Winter Response Tactic(s)
Snow berm
Ice slotting
Water dam

Additional Containment Sites Above this Location:
CS 6-25

Additional Containment Sites Below this Location:
CS 6-2
CS 6-11B
CS 6-11D
CS 6-13
CS 6-23

III. General Site Information

Water Path:
Erickson Creek flows under the pipeline at this site.
Erickson Creek flows into Hess Creek.

Water Variations:
The creek is suscept ble to rain influences.
The stream bank is defined.

LZ Location:
At the site on ROW

Forward Staging Area:
At the site on ROW

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom, Sandbags

Stream Bank Conditions at Site:
Steep but stable
Open areas to access creek

Vegetation Conditions at Site:
Open at site but heavy forest in the area
Moderate brush along the creek

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Site is at ROW bridge #1 crossing of Erickson Creek.

Sites of opportunity are available at numerous downstream locations.

River Data	Staging Areas	Base Map Containment Sites	CS 6-25 Erickson Creek
• Width = 10 ft. - 40 ft. • Velocity = 1 - 5 ft./sec.	• OMS 71-1HR • OMS 73-1H	CS 6-23 CS 6-24 **CS 6-25**	C-Plan Map Ref. 36 Aerial Map Ref. 105, 106 (b) (7)(F), (b) (3) [redacted] Contact AFS/SIS Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Erickson Creek — CS 6-25

I. Site Location

Location Description:
the low water crossing of ROW

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

Primary Access:
Drive-,ROW access ble

Secondary Access:
Helicopter to ROW

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish containment at sites where oil recovery, storage and transport can be optimized.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Water dam at sites of opportunity

Winter Response Tactic(s)
Snow berming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 6-24 CS 6-23
CS 6-19 CS 6-11B
CS 6-11D CS 6-13
CS 6-2

III. General Site Information

Water Path:
Erickson Creek flows approximately three miles downstream to CS 6-24.

Water Variations:
Erickson Creek at this site may be dry at times.

LZ Location:
At this site on ROW

Forward Staging Area:
At this site on ROW

Nearest Pump Station/Response Base:
PS06

Response Equipment On Site (Kits and major items):
Sandbag Kit, Underflow Dam Kit

Stream Bank Conditions at Site:
the low water crossing
Site has good access on both sides downstream

Vegetation Conditions at Site:
Old burn area
Standing dead fall in the area

Location of Nearest Initial Helicopter Refueling Point:
PS06

Utilize Additional Response Resources from:
PS06

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, eagle, small game

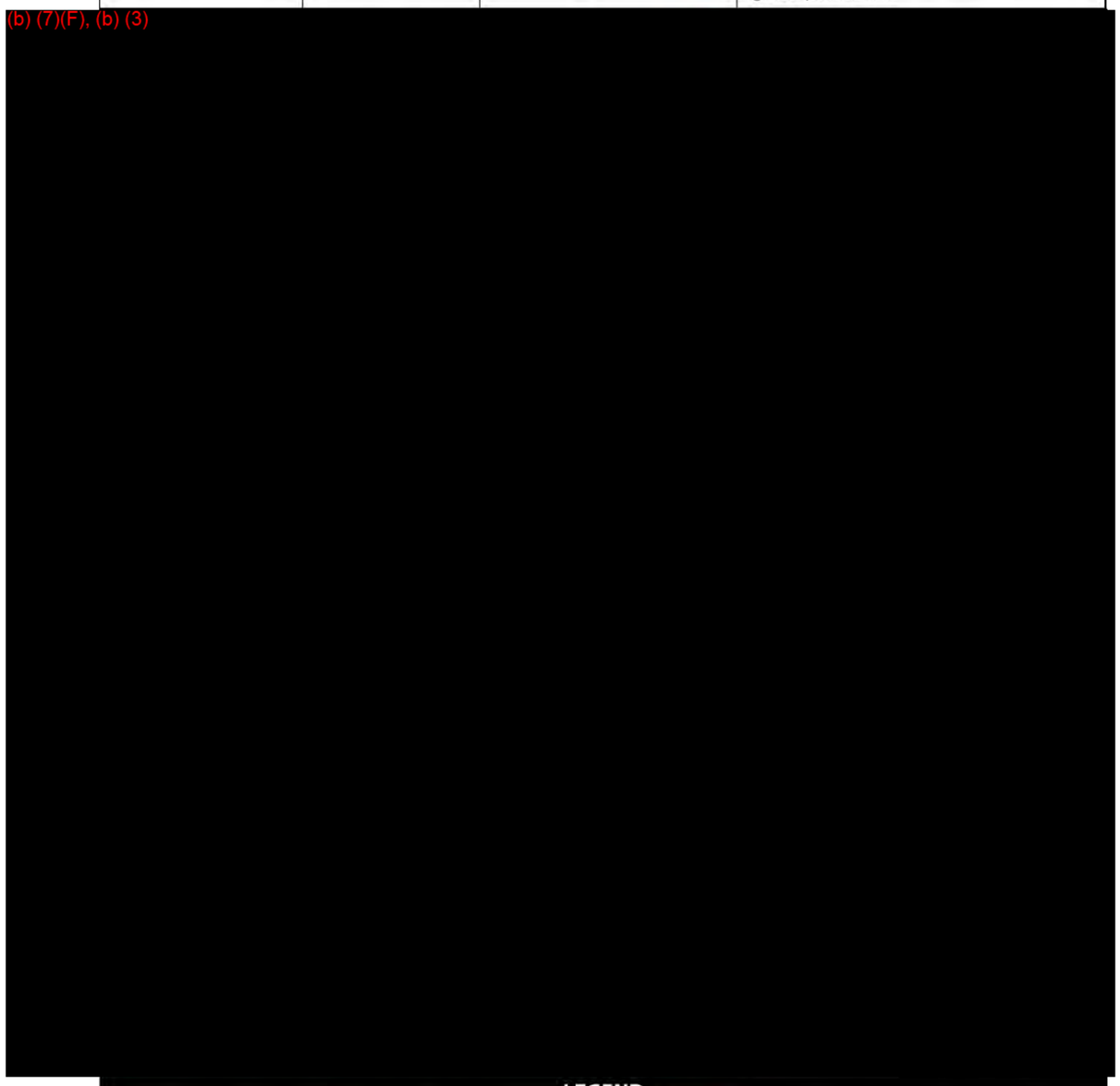
IV. General Site Description

Site has several areas downstream to contain the oil.

The creek is typically dry at the pipe crossing location.

River Data	Staging Areas	Base Map Containment Sites	CS 6-26 West Fork Tolovana River
• Width = 35 ft. - 90 ft. • Velocity = 1 - 5 ft./sec.	• Livengood Camp • AKDOT Livengood • OMS 70.0	**CS 6-26** CS 6-26A CS 6-27 CS 6-29 CS 6-30	C-Plan Map Ref. 37 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

West Fork Tolovana River — CS 6-26

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Manley Springs Road crossing of West Fork Tolovana River	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive, at campground on roadside	Helicopter, LZ in campground

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Booming in open channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 6-26A CS 6-27 CS 6-29 CS 6-30	CS 6-31A

III. General Site Information

Water Path:	Water Variations:
Numerous creeks that cross the pipeline enter the Tolovana River above this site	The river is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
Livengood Camp or in the campground	At the campground on site

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, located at RGV 65, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable soil. Gradual banks along the campground Some cut bank on opposite side	Open around the campground Forested away from the site

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07

Communications Resources Available:
ARTS, VHF, satellite phone, cell phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Numerous sites of opportunity are located above and below the bridge.

The pipeline crossing of Manley Hot Springs Road is located one mile from the site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-26A W. Fork Tolovana River
• Width = 35 ft. - 90 ft. • Velocity = 1 - 5 ft./sec.	• AKDOT Livengood Camp • Livengood Camp • OMS 70-0.0	CS 6-26 **CS 6-26A** CS 6-27 CS 6-29 CS 6-30	C-Plan Map Ref. 37 Aerial Map Ref. 201 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

West Fork Tolovana River CS 6-26A

(b) (7)(F), (b) (3)

I. Site Location

Location Description:		GPS Coordinates:
End of access road off of Manley Hot Springs Road	[redacted]	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive, may need a 4-wheeler	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Booming in open channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 6-27 CS 6-30 CS 6-29	CS 6-26 CS 6-31A

III. General Site Information

Water Path:	Water Variations:
Numerous creeks that cross the pipeline enter the Tolovana River above this site.	The river is suscept ble to rain influences and may have high water levels seasonally.

LZ Location:	Forward Staging Area:
In the clearing away from the river	In the clearing away from the river

Nearest Pump Station/Response Base:

PS07

Response Equipment On Site (Kits and major items):

None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Cut bank in areas three feet to five feet to water level	Forested Access trails are open

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07

Communications Resources Available:

VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Site is difficult to get to from the roadway due to flooding of the trail area.

Alternative sites are available downstream where the river comes alongside the access road.

River Data	Staging Areas	Base Map Containment Sites	CS 6-27 Lost Creek
• Width = 10 ft. - 40 ft. • Velocity = 2 - 8 ft./sec.	• Livengood Camp • OMS 70-0.0 • AK DOT Livengood Camp	CS 6-26 CS 6-26A **CS 6-27** CS 6-29 CS 6-30	C-Plan Map Ref. 37 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Lost Creek CS 6-27

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Lost Creek above West Fork Tolovana River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Booming in open channels Oil may not reach this site in winter

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 6-29 CS 6-30	CS 6-26 CS 6-26A

III. General Site Information

Water Path:	Water Variations:
Lost Creek enters the West Fork Tolovana River below this site.	The creek is suscept ble to rain influences.

LZ Location:	Forward Staging Area:
At site or on winter trail near the site	(b) (7)(F), (b) (3) OMS 71-0

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Some cut bank areas Large gravel bar upstream	Forested, although site is in open area on the river bend

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07.

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, eagle, waterfowl

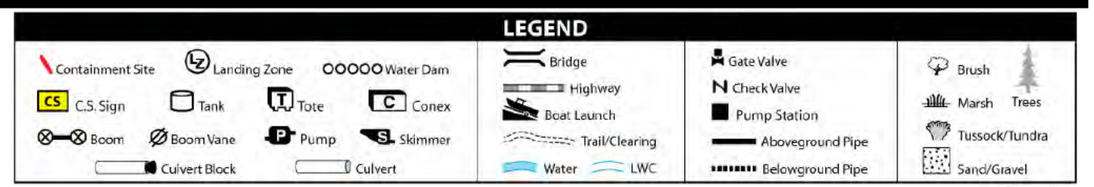
IV. General Site Description

Site is along the foothills and has several meanders that offer potential recovery sites.

River Data	Staging Areas	Base Map Containment Sites	CS 6-29 Lost Creek
• Width = 10 ft. - 40 ft. • Velocity = 2 - 6 ft./sec.	• AKDOT Livengood Camp • 71 APL-1 to OMS 71-8	CS 6-26 CS 6-26A CS 6-27 **CS 6-29** CS 6-30	C-Plan Map Ref. 37 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Lost Creek — CS 6-29

(b) (7)(F), (b) (3)

I. Site Location

Location Description: Dalton Highway crossing of Lost Creek	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Drive, highway accessible	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s): Diversion and containment booming Water dam at low water areas	**Winter Response Tactic(s)** Ice slotting Boom in open areas
Additional Containment Sites Above this Location: CS 6-30	**Additional Containment Sites Below this Location:** CS 6-26 CS 6-26A CS 6-27

III. General Site Information

Water Path: Lost Creek flows into the West Fork Tolovana River far downstream of this site.	**Water Variations:** Lost Creek is susceptible to seasonal and rain influences.
LZ Location: On 71 APL-1	**Forward Staging Area:** On 71 APL-1, OMS 71-8

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site: Bank access good on both sides of the culvert	**Vegetation Conditions at Site:** Forest and brush around the site
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** PS07

Communications Resources Available:
VHF, ARTS, cell phones

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Site has two culverts at highway crossing.

Several good areas to deploy containment are located upstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-30 Lost Creek
• Width = 10 ft. - 40 ft. • Velocity = 2 - 8 ft./sec.	• AKDOT Livengood Camp • 71 APL-1 to OMS 71-8	CS 6-26 CS 6-26A CS 6-27 CS 6-29 **CS 6-30**	C-Plan Map Ref. 37 Aerial Map Ref. 199 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · CS Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Lost Creek — CS 6-30

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Pipeline crossing of Lost Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive, ROW accessible

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Booming and water dam at the low water crossing

Winter Response Tactic(s)
Snow berming
Booming in open areas

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 6-26 CS 6-26A
CS 6-27 CS 6-29

III. General Site Information

Water Path:
Lost Creek passes under and alongside the pipeline.
Creek enters West Fork Tolovana River downstream.

Water Variations:
The creek level varies from low water crossing to steady flow.
Some drainage areas are nearby.

LZ Location:
At site on ROW

Forward Staging Area:
At site on ROW, OMS 71-8

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable
Some steep areas 2-4' to water level

Vegetation Conditions at Site:
Forested
Brush along the trail

Location of Nearest Initial Helicopter Refueling Point:
Fairbanks

Utilize Additional Response Resources from:
PS07

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

Wildlife Sensitivities: moose, bear, small game, eagle

IV. General Site Description

Site is one of several areas where Lost Creek comes near the pipeline.

The low water crossing and creek bends offer containment areas.

River Data	Staging Areas	Base Map Containment Sites	CS 6-31A Tolovana River
• Width = 35 ft. - 90 ft. • Velocity = 1 - 5 ft./sec.	• AK DOT Livengood Camp • Livengood Camp • OMS 70-0.0	CS 6-31A CS 6-34 CS 6-37 CS 6-38	C-Plan Map Ref. 38 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam	Bridge	Gate Valve	Brush
C.S. Sign; Tank; Tote; Conex	Highway	Check Valve	Marsh; Trees
Boom; Boom Vane; Pump; Skimmer	Boat Launch	Pump Station	Tussock/Tundra
Culvert Block; Culvert	Trail/Clearing	Aboveground Pipe	Sand/Gravel
	Water; LWC	Belowground Pipe	

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tolovana River — CS 6-31A

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Tolovana River	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat- downstream from the pipeline

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Establish deflection and containment boom site(s) at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Ice slotting Booming in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None in the region	None

III. General Site Information

Water Path:	Water Variations:
N/A	The river is suscept ble to seasonally high water levels.

LZ Location:	Forward Staging Area:
At site	OMS 69-1R

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gradual Stable soils	Forested Open bars and clearings available

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07 Nordale Yard

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, waterfowl, eagle

IV. General Site Description

Site is one of many river bends that can support deployment activities in the area.

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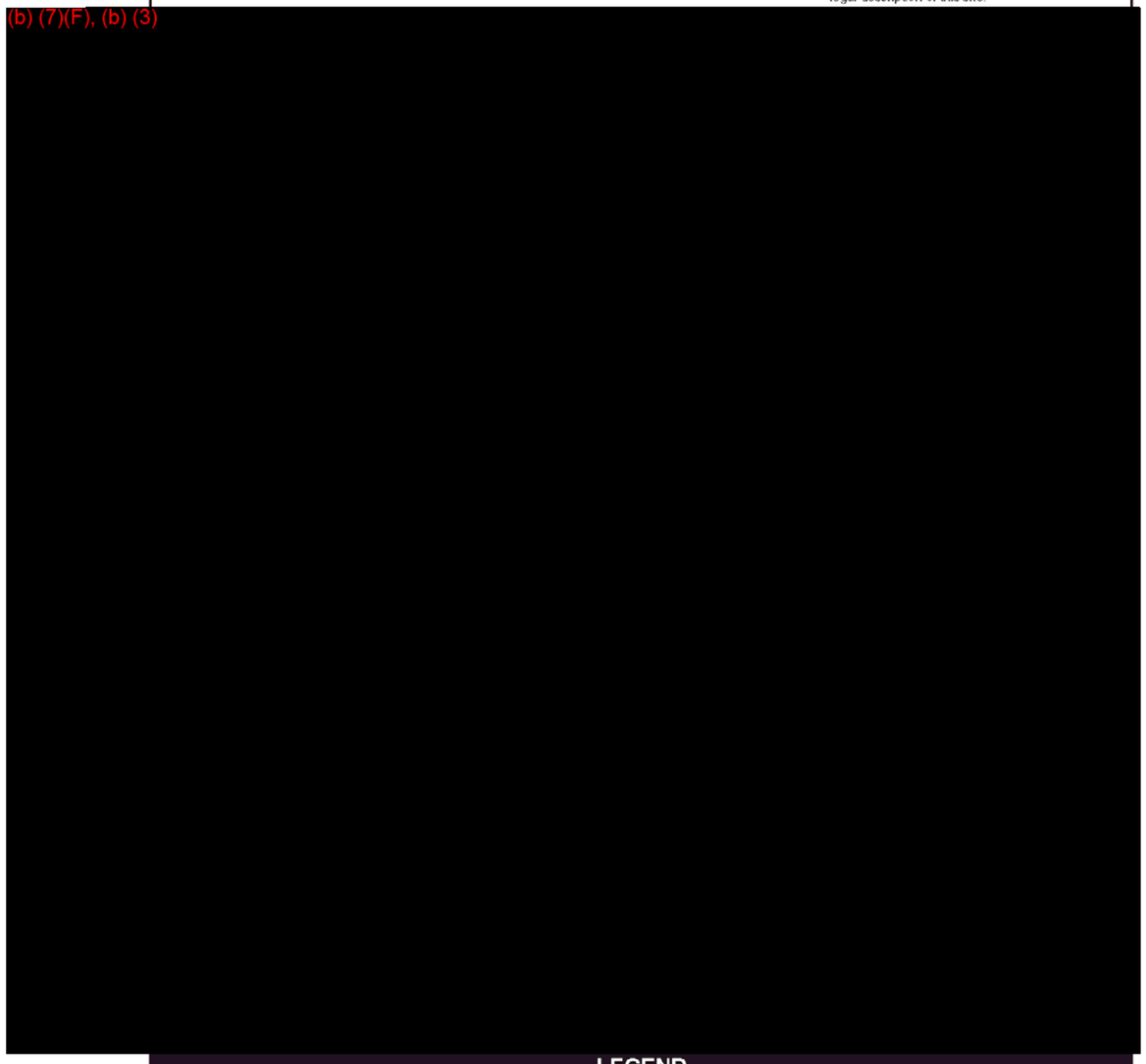
Wilber Creek — CS 6-34

River Data	Staging Areas	Base Map Containment Sites	CS 6-34 Wilber Creek
• Width = 3 ft. - 15 ft. • Velocity = 1 - 4 ft./sec.	• AK DOT Livengood Camp • Abandoned OMS @ 69 APL/AMS & PLMP 405.9	CS 6-31A **CS 6-34** CS 6-37 CS 6-38	C-Plan Map Ref. 38 Aerial Map Ref. 207 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Pipeline crossing of Wilber Creek	N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- ROW access ble	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Water dam and culvert block	Culvert block Snow berming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Several small creeks feed into Wi ber Creek above this site. There are culverts at the work pad.	The creek flows in defined channels at the culverts.

LZ Location:	Forward Staging Area:
At the work pad	At the work pad

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Auxiliary Conex stored at RGV 65

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Actual site is on ROW and open Defined bank with culverts	Some trees along the bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07 Nordale Yard.

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: moose, bear, eagle

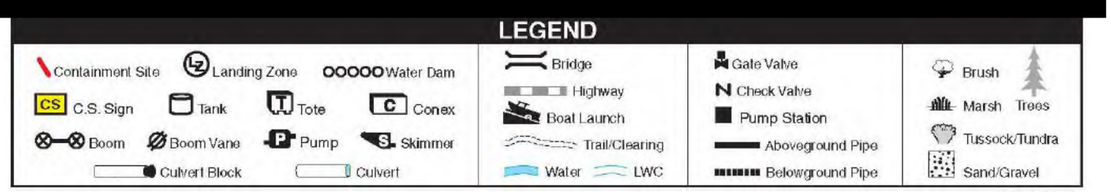
IV. General Site Description

Site has several areas of opportunity nearby.

Site is at the bottom of a long hill/bluff.

River Data	Staging Areas	Base Map Containment Sites	CS 6-35 Tatalina River
• Width = 30 ft. - 60 ft. • Velocity = 1 - 3 ft./sec.	• PS 7 • 66 APL-2 • OMS 66-1R	CS 6-35 CS 7-3 CS 7-4 CS 7-5 CS 7-6	C-Plan Map Ref. 39 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Tatalina River

CS 6-35

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3),

Primary Access:	
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Booming and water dam at areas of opportunity near the site	Ice slotting Booming Oil may not reach this site in winter

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 7-3	CS 7-4	None
CS 7-5	CS 7-6	

III. General Site Information

Water Path:	Water Variations:
Numerous creeks cross the pipeline that empty into the Tatalina River above this site.	The river does not appear to be prone to flooding, but it is susceptible to seasonal and rain influences.
LZ Location:	**Forward Staging Area:**
At site on the point in the river	OMS 66-1R

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Boom, Raft Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Two feet to four feet to water Steep bank	Forest with clearing on point for site
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Fairbanks.	PS07

Communications Resources Available:
Satellite phone

Wildlife Sensitivities: moose, bear, eagle, waterfowl

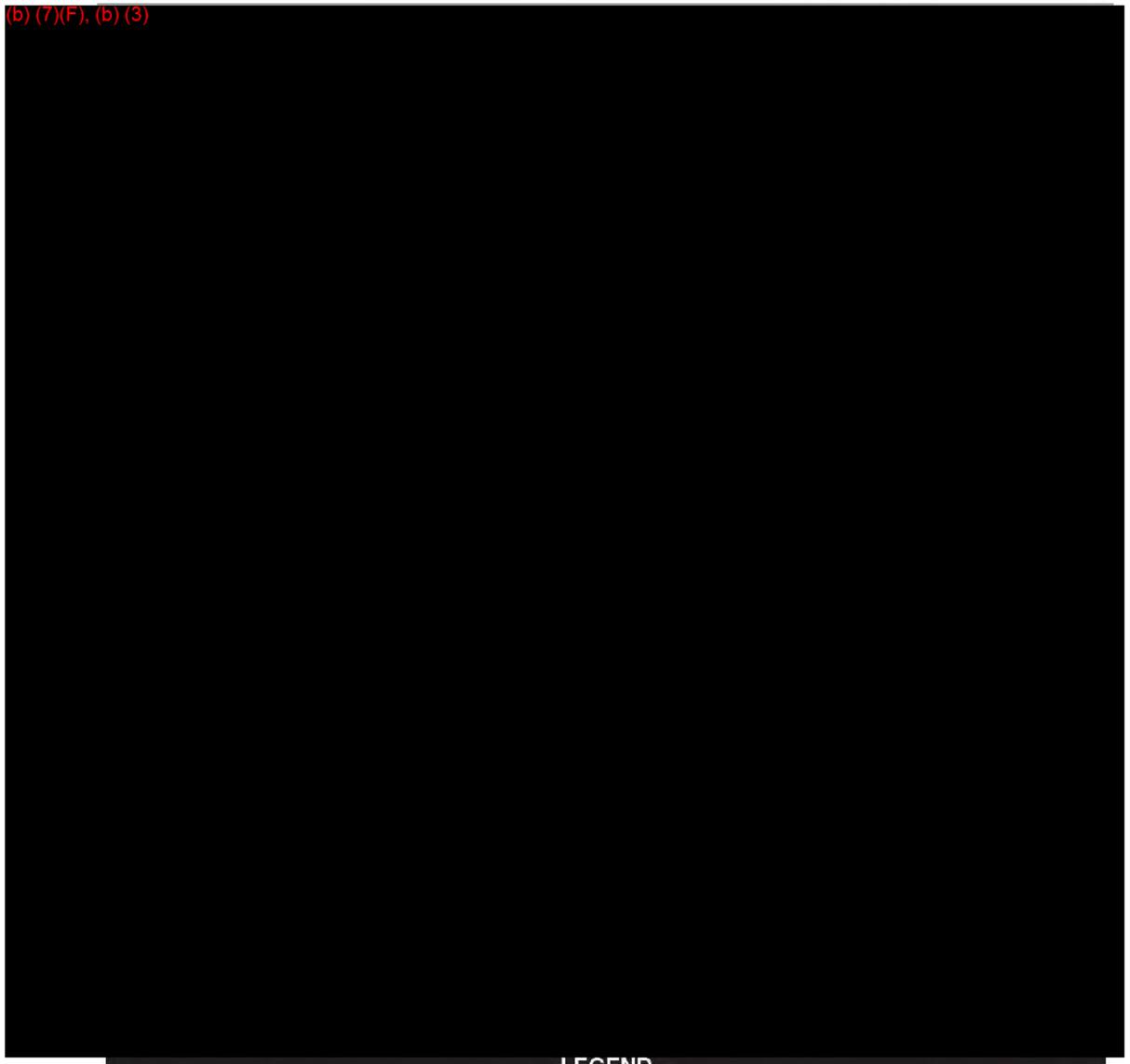
IV. General Site Description

Site is one of many river bends in the area.

River Data	Staging Areas	Base Map Containment Sites	CS 6-37 Slate Creek
• Width = 10 ft. - 30 ft. • Velocity = 1 - 3 ft./sec.	• 68 AMS-1 • PS 7	CS 6-31A **CS 6-34** CS 6-37 CS 6-38	C-Plan Map Ref. 38 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Slate Creek CS 6-37

I. Site Location

Location Description:	Nearest Highway M	GPS Coordinates:
Slate Creek below the pipeline	N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site-Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment booming and water dams at areas of opportunity upstream	Ice slotting Oil may not reach this site in winter. (1.6 air miles)

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 6-38	None

III. General Site Information

Water Path:	Water Variations:
Slate Creek flows under the pipeline above this site.	The creek is in a defined channel in this area, but is susceptible to rain influences.

LZ Location:	Forward Staging Area:
At site	OMS/AMS 68-1

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Sandbag Kit, Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Defined banks Two to four feet bank heights at normal water levels	Heavy brush and trees overhang the creek

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07 Nordale Yard.

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: moose, bear, small game, eagle

IV. General Site Description

This site is on a slow meander in the creek.

Areas of opportunity are located above and below the site.

River Data	Staging Areas	Base Map Containment Sites	CS 6-38 Slate Creek
• Width = 10 ft. - 20 ft. • Velocity = 1 - 4 ft./sec.	• OMS 68-1 • PS07	CS 6-31A **CS 6-38** CS 6-34 CS 6-37	C-Plan Map Ref. 38 Aerial Map Ref. 208 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Slate Creek CS 6-38

I. Site Location

Location Description:	Nearest Highway MP:	PS Coordinates:
Slate Creek above the pipeline	N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Primary Access:	Seco
Walk in from the workpad.	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s)
Containment and water dam at numerous sites	Ice slotting Snow berming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 6-37 and ROW crossing.

III. General Site Information

Water Path:	Water Variations:
North Fork of Slate Creek crosses and parallels the pipeline above this site. Slate Creek crosses the pipeline just below this site.	The creeks have defined channels, but they are suscept ble to rain influences.
LZ Location: At site or on ROW	**Forward Staging Area:** On ROW or OMS/AMS 684, OMS 68-1

Nearest Pump Station/Response Base:

PS07.

Response Equipment On Site (Kits and major items):

Boom, Culvert Block Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Some steep or cutbank areas	Heavy brush and trees
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** PS07 Nordale Yard.

Communications Resources Available:

VHF, ARTS, satellite phone

Wildlife Sensitivities: bear, eagle, small game

IV. General Site Description

Site is used to contain oil from North Fork Slate Creek.

Portable pipeline and decanting is possible due to proximity to additional areas of opportunity downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 7-3 Globe Creek
• Width = 10 ft. - 40 ft. • Velocity = 1 - 4 ft./sec.	• PS07 • Elliot Hwy. Pullout and parking areas	CS 6-35 **CS 7-3** CS 7-4 CS 7-5 CS 7-6	C-Plan Map Ref. 39 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh
Water Dam	Boat Launch	Pump Station	Trees
C.S. Sign	Trail/Clearing	Aboveground Pipe	Tussock/Tundra
Tank	Water	Belowground Pipe	Sand/Gravel
Tote	LWC		
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Globe Creek CS 7-3

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive via Elliot Highway pullout	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized. Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming and water dam at areas of opportunity	Ice slotting Booming in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-5 CS 7-6	CS 6-35 CS 7-4

III. General Site Information

Water Path:	Water Variations:
Multiple small creeks flow into Little Globe Creek and under the pipeline above this point.	The creek is suscept ble to rain and spring flooding influences.
LZ Location:	**Forward Staging Area:**
At site, off to the side of the public pullout	Old Elliot Highway or 66 AMS-3

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Boom, Portable MegaSecur Dam ; stored at PS07

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable and defined Some cut bank or steep areas	Heavy brush and trees in the area
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Fairbanks	PS07 Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, small game, eagle

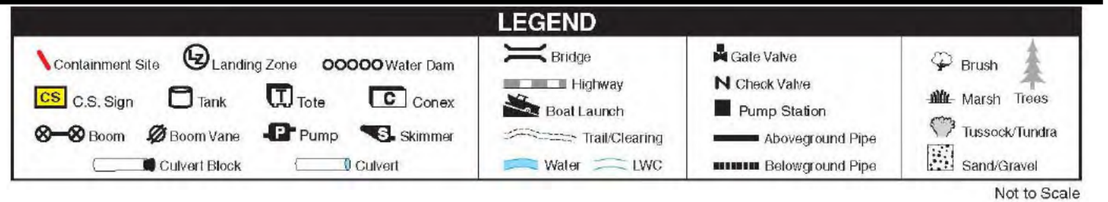
IV. General Site Description

Areas of opportunity above this site as well.

River Data	Staging Areas	Base Map Containment Sites	CS 7-4 Globe Creek
• Width = 10 ft. - 30 ft. • Velocity = 1 - 3 ft./sec.	• PS 7 • Pipeline Work Pad @ 417.5	CS 6-35 CS 7-3 **CS 7-4** CS 7-5 CS 7-6	C-Plan Map Ref. 39 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AT-SO Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Globe Creek — CS 7-4

(b) (7)(F), (b) (3)

I. Site Location

Location Description:	GPS Coordinates:
(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming and water dam at areas of opportunity	Ice slotting Water dam

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-3 CS 7-5 CS 7-6	CS 6-35

III. General Site Information

Water Path:	Water Variations:
Numerous creeks cross the pipeline above this site. Globe Creek flows under the pipeline above this site.	The creek is suscept ble to rain influence.

LZ Location:	Forward Staging Area:
At site- on the winter trail	66 AMS-3

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Sorbent boom, tote, , Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable and defined	Heavy brush along the banks

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS07	PS07 Nordale yard

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, eagle

IV. General Site Description

This site is an open area with trees along the banks.

Areas of opportunity are nearby.

River Data	Staging Areas	Base Map Containment Sites	CS 7-5 Little Globe Creek
• Width = 3 ft. - 10 ft. • Velocity = 1 - 3 ft./sec.	• PS 7 • Work Pad near PLMP 421 • 66 APL-2	CS 6-35 CS 7-3 CS 7-4 CS 7-5 CS 7-6	C-Plan Map Ref. 39 Aerial Map Ref. 215 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | T Tote | C Conex | Highway | N Check Valve | Marsh | Trees
Boom | Boom Vane | P Pump | S Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Little Globe Creek CS 7-5

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - ROW accessible	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming and water dam at areas of opportunity along the creek	Snow berming Water dam downstream of the site
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 6-35 CS 7-3 CS 7-4 CS 7-6

III. General Site Information

Water Path:	Water Variations:
Little Globe Creek flows into Tr butary Creek at CS 7-6.	The creek is suscept ble to rain influence.
LZ Location: Work pad north of headache bars	**Forward Staging Area:** On ROW

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Culvert Block Kit stored on 66APL2 access road by gate to CS 7-5

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
LWC with good access downstream	Small trees Open walking among the spruce
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** PS07 Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone

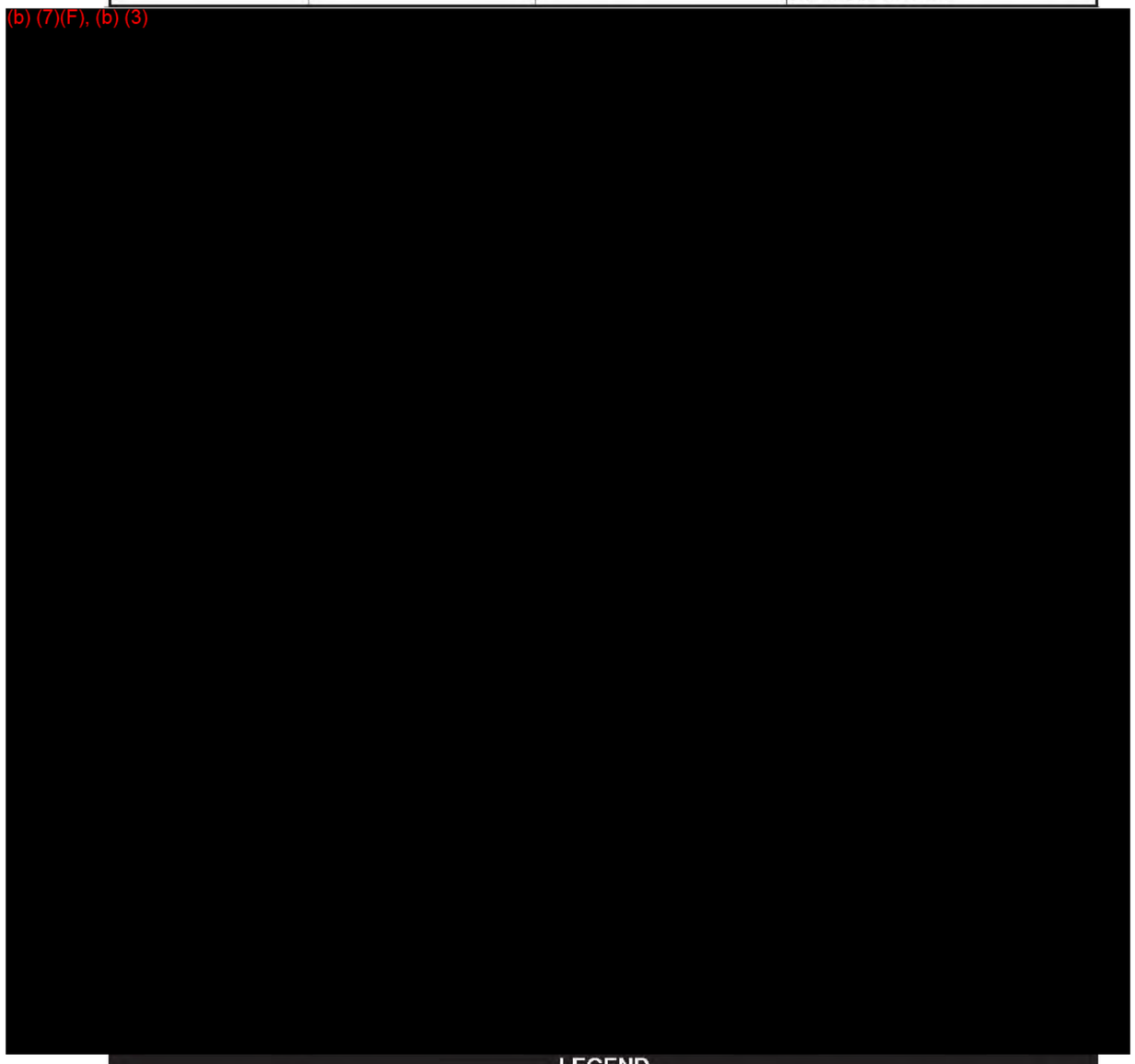
Wildlife Sensitivities: Moose, bear, eagle

IV. General Site Description

Little Globe Creek run parallel to the work pad as well as the LWC site.

River Data	Staging Areas	Base Map Containment Sites	CS 7-6 Tributary Creek
• Width = 3 ft. - 8 ft. • Velocity = 1 - 3 ft./sec.	• PS 7 • 66 APL-2	CS 6-35 CS 7-3 CS 7-4 CS 7-5 CS 7-6	C-Plan Map Ref. 39 Aerial Map Ref. 215 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tributary Creek

CS 7-6

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Drive - Elliot Highway to 66 APL-2

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Water dam at areas of opportunity at the pipeline and downstream of the site

Winter Response Tactic(s):
Snow berming
Water dam

Additional Containment Sites Above this Location:
CS 7-5

Additional Containment Sites Below this Location:
CS 7-3 CS 7-4
CS 6-35

III. General Site Information

Water Path:
Tributary Creek flows under the pipeline at this site and joins Little Globe Creek just below.

Water Variations:
The creek is suscept ble to rain influence.

LZ Location:
At site- on ROW

Forward Staging Area:
Elliot highway turnout

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Sorbent boom toteUnderflow Dam Kit

Stream Bank Conditions at Site:
Stable and gradual
Site is LWC on the pipeline

Vegetation Conditions at Site:
Small trees and moderate brush

Location of Nearest Initial Helicopter Refueling Point:
Fairbanks

Utilize Additional Response Resources from:
PS07
Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, eagle, small game

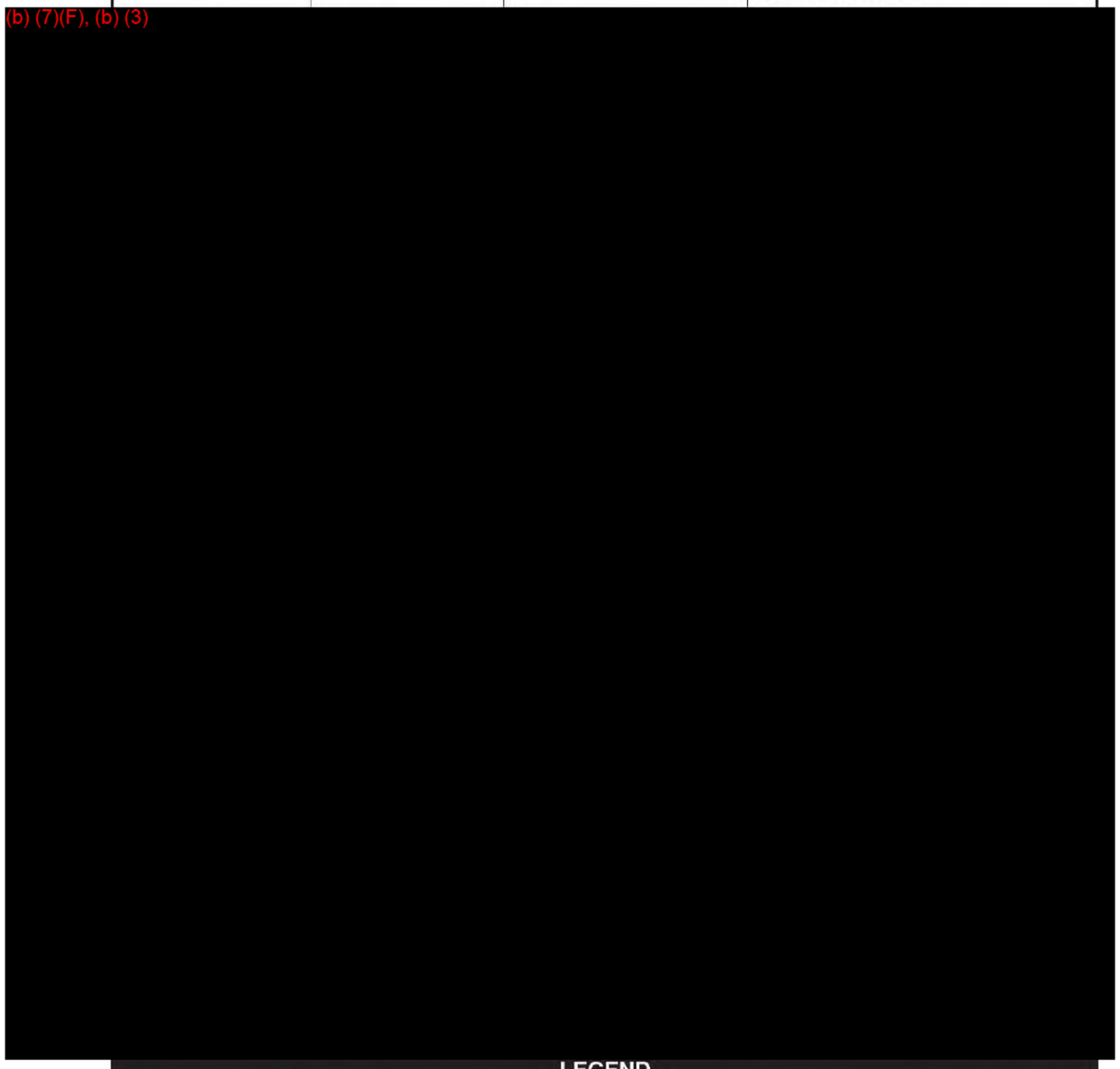
IV. General Site Description

This site has several response options between pipeline and Elliot Highway.

River Data	Staging Areas	Base Map Containment Sites	CS 7-7 Aggie Creek
• Width = 20 - 50 ft. • Velocity = 1 - 3 ft./sec.	• 65AMS-2 • OMS 65-1M • PS 7	**CS 7-7** CS 7-8 CS 7-9 CS 7-10	C-Plan Map Ref. 40W Aerial Map Ref. NA (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Alyeska pipeline SERVICE COMPANY

Aggie Creek — CS 7-7

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Aggie Creek above Washington Creek	N/A (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment and water dams	Ice slotting Water dam Oil may not reach this site in winter due to the distance

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS7-8 CS 7-9 CS 7-10	None in the area

III. General Site Information

Water Path:	Water Variations:
Multiple drainages cross the pipeline and enter Aggie Creek.	The creek is suscept ble to rain and seasonal influences, although it is generally stable.

LZ Location:	Forward Staging Area:
At site- on the creek bend	(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Solid soils Some slope to the creek bank	Forested Site is in the open Light brush area

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
PS07	PS07 Nordale Yard

Communications Resources Available:
Satellite phone

Wildlife Sensitivities: Moose, bear, eagle, waterfowl

IV. General Site Description

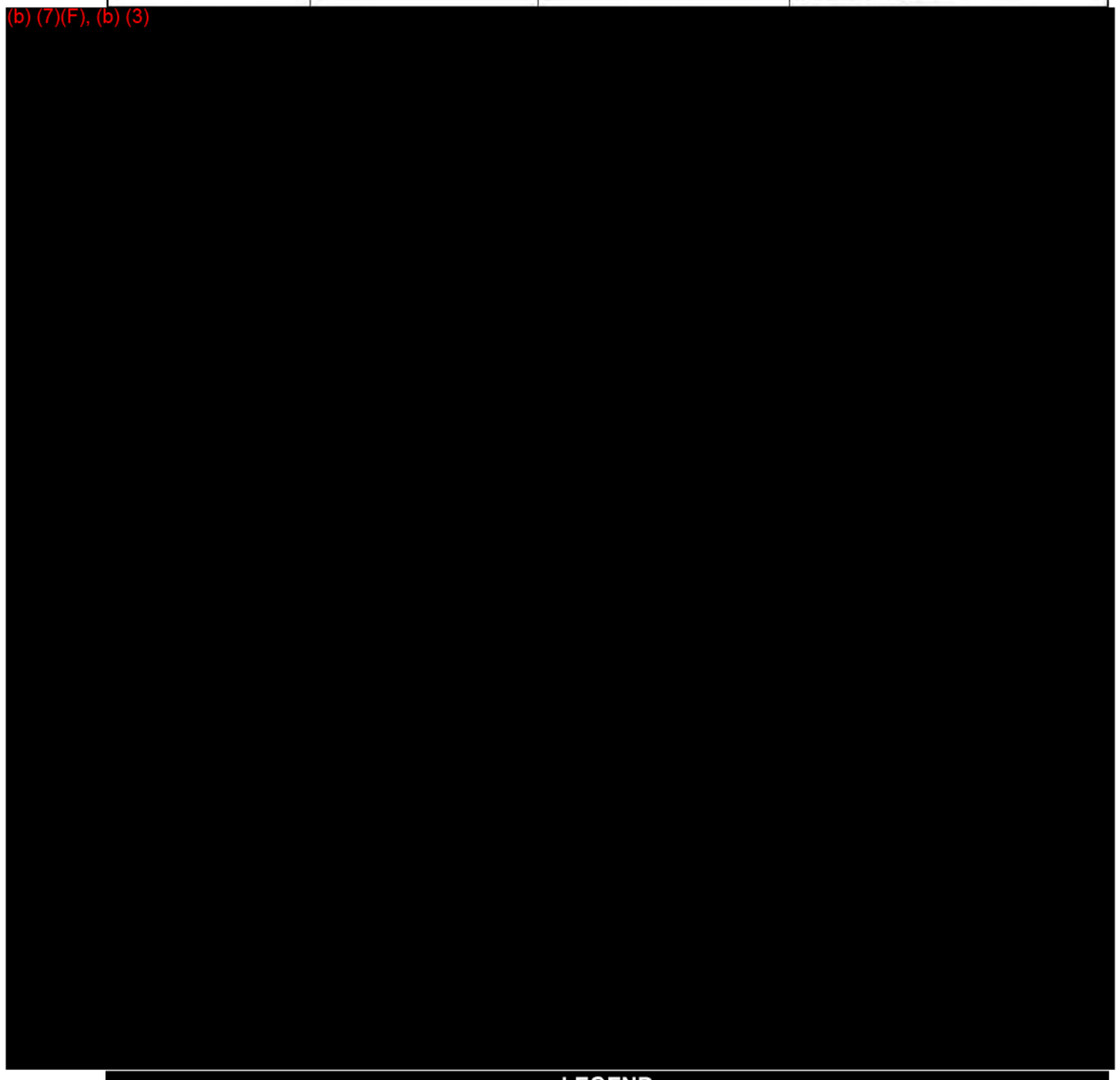
This site is many miles downstream of the pipeline crossing.

Numerous areas of opportunity above this site.

River Data	Staging Areas	Base Map Containment Sites	CS 7-8 Aggie Creek
• Width = 3 - 8 ft. • Velocity = 0 - 2 ft./sec.	• OMS 65-1M • PS 7	CS 7-7 **CS 7-8** CS 7-9 CS 7-10	C-Plan Map Ref. 39 Aerial Map Ref. NA (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | CS Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Aggie Creek

CS 7-8

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam with boom at high water levels	Ice slotting Water dam
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 7-7

III. General Site Information

Water Path:	Water Variations:
Aggie Creek drains several areas and flows into Washington Creek.	The creek is suscept ble to rain and seasonal influences.
LZ Location: At site	**Forward Staging Area:** OMS 65-1M

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable and defined One to four feet drop to water level	Light trees and shrubs Some soft wa king areas
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** PS07 Nordale Yard

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Moose, bear, eagle

IV. General Site Description

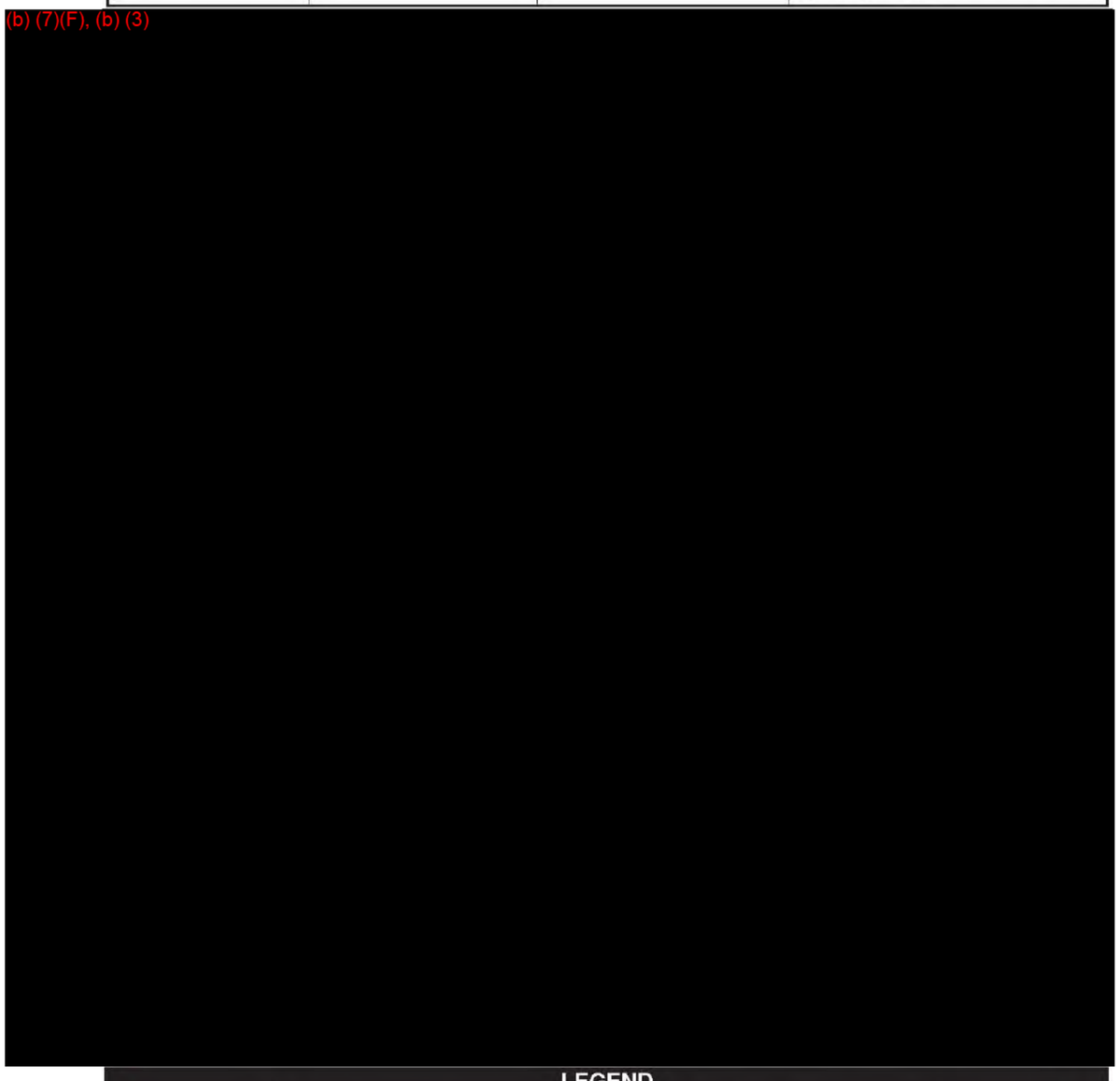
This site is in a meander area at the confluence of two Aggie Creek tributaries.

May have to deploy to other tributary depending on the spill site.

River Data	Staging Areas	Base Map Containment Sites	CS 7-9 Enigma Creek
• Width = 3 - 8 ft. • Velocity = 0 - 2 ft./sec.	• OMS 65-1M • PS 7	CS 7-7 CS 7-8 **CS 7-9** CS 7-10	C-Plan Map Ref. 39 Aerial Map Ref. NA (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Enigma Creek

CS 7-9

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam at low water levels Possibly use boom at high water levels	Ice slotting Oil may not reach this far due to the distance from the pipeline (2+ miles)

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-8	CS 7-7

III. General Site Information

Water Path:	Water Variations:
Site serves both Aggie and Enigma Creeks.	Area is wet and marshy. Creek is generally defined.

LZ Location:	Forward Staging Area:
At site	OMS 65-1M

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Defined	Light trees with open wetland nearby

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07 Nordale Yard

Communications Resources Available:
VHF, satellite phone

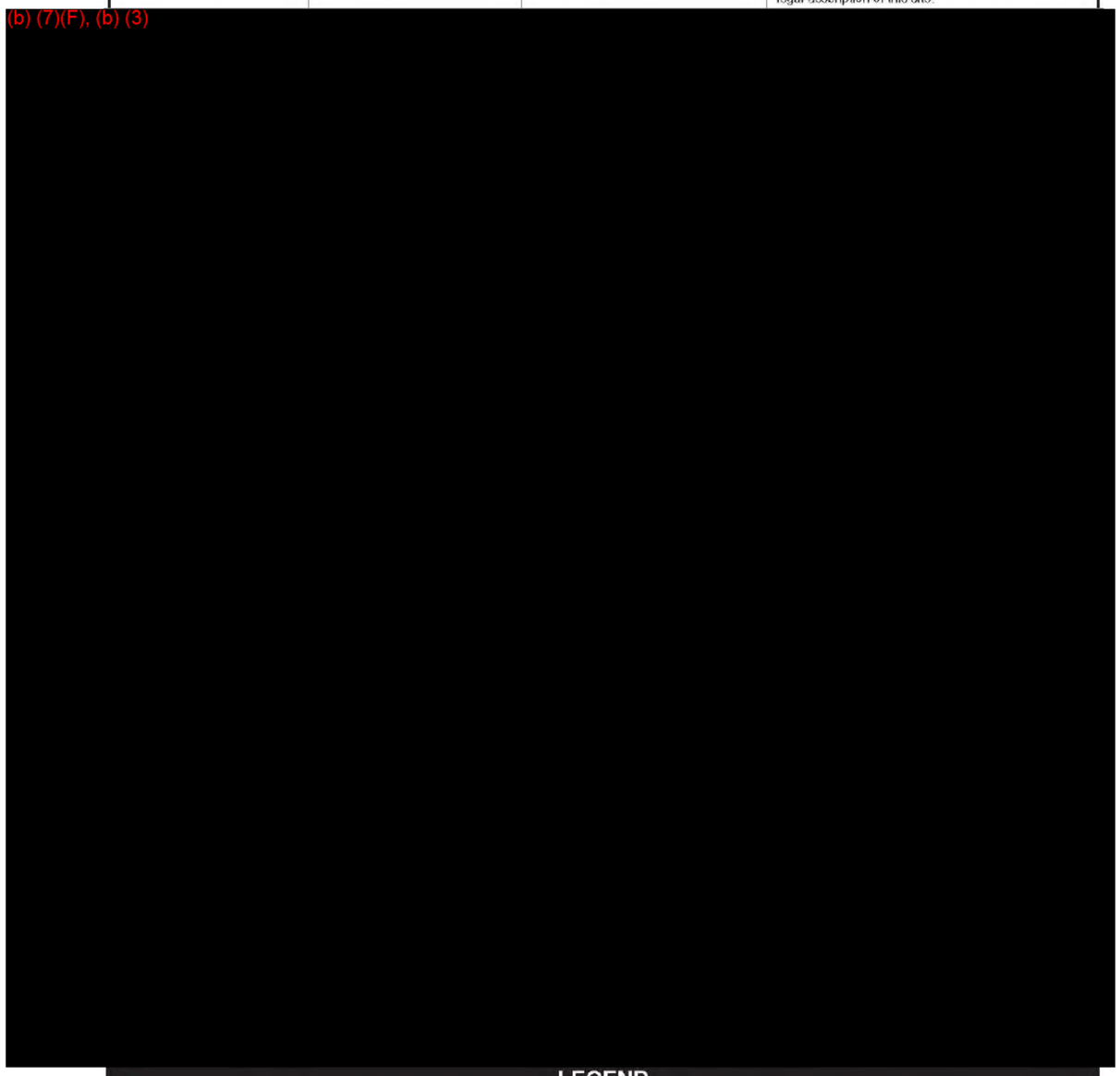
Wildlife Sensitivities: Moose, bear, eagle, waterfowl

IV. General Site Description

Numerous areas of opportunity upstream of the site.

The area may flood during heavy rains.

River Data	Staging Areas	Base Map Containment Sites	CS 7-10 Branch Creek
• Width = 3 - 8 ft. • Velocity = 0 - 2 ft./sec.	• OMS 65-1M • PS 7	CS 7-7 CS 7-8 CS 7-9 CS 7-10	C-Plan Map Ref. 39 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North



(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site, Landing Zone, Water Dam	Bridge	Gate Valve	Brush, Trees
C.S. Sign, Tank, Tote, Conex	Highway	Check Valve	Marsh
Boom, Boom Vane, Pump, Skimmer	Boat Launch	Pump Station	Tussock/Tundra
Culvert Block, Culvert	Trail/Clearing	Aboveground Pipe	Sand/Gravel
	Water, LWC	Belowground Pipe	

Not to Scale

Alyeska pipeline

Branch Creek

CS 7-10

I. Site Location

(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

Helicopter	**Secondary Access:** Helicopter
	GPS Coordinates: (b) (7)(F), (b) (3) [redacted]

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s): Water dam with possible containment booming at high water levels	**Winter Response Tactic(s):** Ice slotting Water dam
Additional Containment Sites Above this Location: CS 7-8 CS 7-9	**Additional Containment Sites Below this Location:** CS 7-7

III. General Site Information

Water Path: Aggie Creek and Branch Creek both pass under the pipeline above this site.	**Water Variations:** The creek is suscept ble to rain and seasonal influences, although it is generally stable.
LZ Location: At site	**Forward Staging Area:** OMS 65-1M

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
Underflow Dam Kit, Sandbag Kit

Stream Bank Conditions at Site: Defined One to four feet to water level	**Vegetation Conditions at Site:** Light trees and vegetation
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** PS07 Nordale Yard

Communications Resources Available:
Satellite phone

Wildlife Sensitivities: Moose, bear, eagle, waterfowl

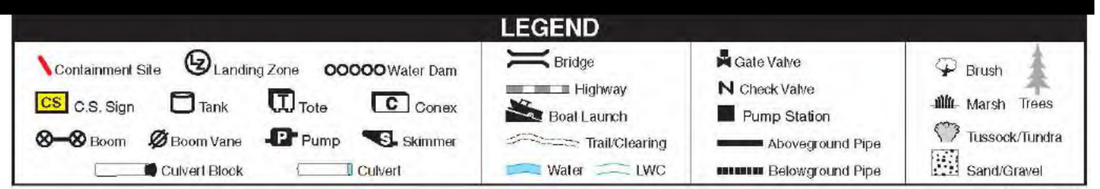
IV. General Site Description

This site is approximately 3.5 miles downstream of the pipeline crossing.

Numerous areas of opportunity are located above this site.

River Data	Staging Areas	Base Map Containment Sites	CS 7-11 Snowshoe Creek
• Width = 0 - 3 ft. • Velocity = 0 - 2 ft./sec.	• 64 APL-2 • PS 7	CS 7-11 CS 7-12 CS 7-13	C-Plan Map Ref. 40 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Snowshoe Creek CS 7-11

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - on APL road	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Primarily water dam with culvert block at the roadway	Culvert block Oil may not reach this point due to the distance from the pipeline
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 7-13

III. General Site Information

Water Path:	Water Variations:
Snowshoe Creek crosses the pipeline 6.5 miles upstream of this site.	There are minimal water variations.
LZ Location: At site- on ROW	**Forward Staging Area:** At site- on ROW

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Some wetland wa king off of the work pad	Low brush Spongy areas
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** PS07 Nordale Yard

Communications Resources Available:
ARTS, VHF, satellite phone

Wildlife Sensitivities: Moose, bear, eagle

IV. General Site Description

This site is a small culvert crossing on APL.

Additional high water culvert is nearby.

River Data	Staging Areas	Base Map Containment Sites	CS 7-12 Carver Creek
• Width = 2 - 4 ft. • Velocity = 0 - 2 ft./sec.	• 64 APL-2 • PS 7 • Fairbanks/Nordale	CS 7-11 **CS 7-12** CS 7-13	C-Plan Map Ref. 40 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Carver Creek — CS 7-12

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Carver Creek upstream of Washington Creek	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.
Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Water dam	Water dam Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Carver Creek parallels the pipeline before entering Washington Creek downstream.	High water flooding of the area is possible.

LZ Location:	Forward Staging Area:
At site	(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Marshy Undefined in areas	Wet and grassy with some small trees

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07 Nordale Yard

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Moose, bear, eagle, waterfowl

IV. General Site Description

This site is in a marshy open area.

Numerous additional locations are upstream.

River Data	Staging Areas	Base Map Containment Sites	CS 7-13 Washington Creek
• Width = 10 - 20 ft. • Velocity = 1 - 3 ft./sec.	• 64 APL-2 • Work Pad @ PLMP 432 • PS 7	CS 7-11 CS 7-12 **CS 7-13**	C-Plan Map Ref. 40 Aerial Map Ref. 221 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Washington Creek CS 7-13

I. Site Location

Location Description:		GPS Coordinates:
Pipeline crossing of Washington Creek	(b) (7)(F), (b) (3) [redacted]	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - ROW accessible	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming	Ice slotting Booming in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-11	None

III. General Site Information

Water Path:	Water Variations:
Washington Creek drains several smaller creeks in this area.	The creek is suscept ble to rain and seasonal influences.

LZ Location:	Forward Staging Area:
At site on ROW	At site on ROW

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Defined and stable	Moderate brush with open areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	PS07 Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, eagle

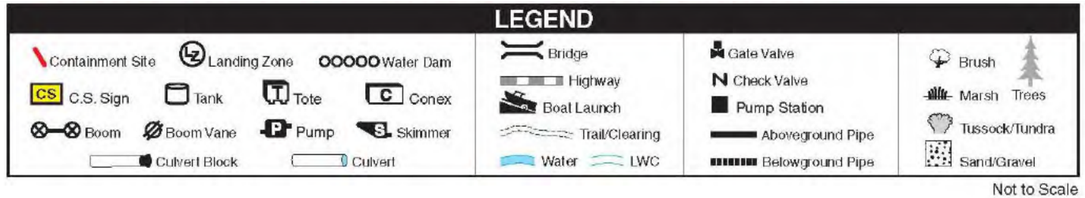
IV. General Site Description

Several sites of opportunity are located downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 7-14A Chatanika River
• Width = 6 - 20 ft. • Velocity = 1 - 3 ft./sec.	• PL 7 • OMS 63-1	CS 7-14A CS 7-16 CS 7-17 CS 7-18 CS 7-20 CS 7-21 CS 7-22 CS 7-23	C-Plan Map Ref. 40W, 41WA Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]



Not to Scale

Alyeska pipeline

Chatanika River CS 7-14A

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Chatanika River- approx. 13.7 air miles from pipeline	N/A	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy deflection boom to divert oil to containment and recovery areas.
Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	N/A

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-16 CS 7-17 CS 7-18 CS 7-20 CS 7-21 CS 7-22 CS 7-23	None

III. General Site Information

Water Path:	Water Variations:
Chatanika River flows into the Minto Flats from this location.	The creek is susceptible to seasonal influences. Gravel bars and banks may disappear at high water levels.
LZ Location: At site	**Forward Staging Area:** OMS 63-1

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable soils Three to five feet drop with generally open access	Forested with dense brush along the river bank
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** Nordale Yard

Communications Resources Available:
Satellite phone

Wildlife Sensitivities: Moose, bear, small game, eagle, waterfowl

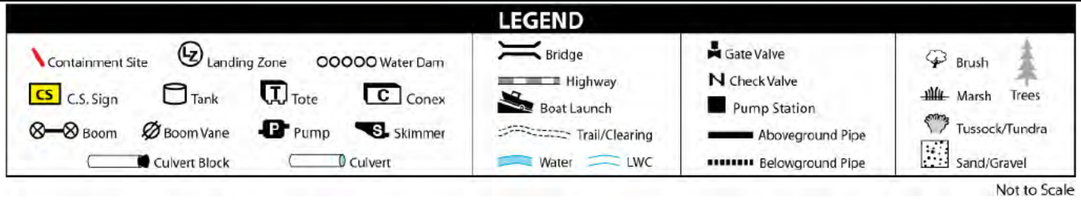
IV. General Site Description

Site is approximately 14 air miles downstream of the pipeline on a long gradual bend.

There are numerous gravel bars and areas of opportunity upstream.

River Data	Staging Areas	Base Map Containment Sites	CS 7-14B Chatanika River
• Width = 50 ft. - 200 ft. • Velocity = 1 - 4 ft./sec.	• Bennett Road • PS07	CS 7-14B	C-Plan Map Ref. 41WB Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Chatanika River — CS 7-14B

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Chatanika River at Bennett Road	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - Bennett Road ends across from the site	Helicopter- site is on an island

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage, and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy deflection boom to divert oil to containment and recovery areas.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	May not encounter oil at this site in winter Booming and water dam in channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-14A	None

III. General Site Information

Water Path:	Water Variations:
Chatanika River is fed by numerous creeks. The river enters the Minto Flats region downstream.	The river is suscept ble to seasonal and rain influences.
LZ Location:	**Forward Staging Area:**
At site- LZ is on island, alternative is at Bennett Road	End of Bennett Road

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Gradual slope with gravel	Light brush around the site Large trees and dense brush upstream
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, CB, satellite phone

Wildlife Sensitivities: Moose, bear, eagle, waterfowl

IV. General Site Description

Site is located on the tip of an island.

Numerous areas are present to deflect and recover oil in the area.

Be aware of debris in the river at high water levels.

River Data	Staging Areas	Base Map Containment Sites	CS 7-16 Unnamed Creek
• Width = 30 - 50 ft. • Velocity = 1 - 3 ft./sec.	• PS 7 & 8 • OMS 63-1	CS 7-14A **CS 7-16** CS 7-17 CS 7-18 CS 7-20 CS 7-21 CS 7-22 CS 7-23	C-Plan Map Ref. 40 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Creek — CS 7-16

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Unnamed Creek confluence with Chatanika River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat - to site- downstream on Chatan ka River.

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Prevent oil from moving past the recovery sites by establishing containment.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish containment booming operations at sites of opportunity near the containment site.

Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming at the creek outlet Water dam possible above the site	Oil may not reach this site in winter Water dam at creek outlet

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-14A

III. General Site Information

Water Path:	Water Variations:
The creek enters the Chatanika River at this site.	The creek is suscept ble to rain influence. The creek is small and trickles mostly.

LZ Location:

At site- on bend in the Chatanika River near the creek mouth (b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:

PS07

Response Equipment On Site (Kits and major items):

None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Creek is on solid ground above the river	Large trees Access path and open areas underneath

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:

VHF, satellite phone

Wildlife Sensitivities: Moose, bear, small game, waterfowl, eagle

IV. General Site Description

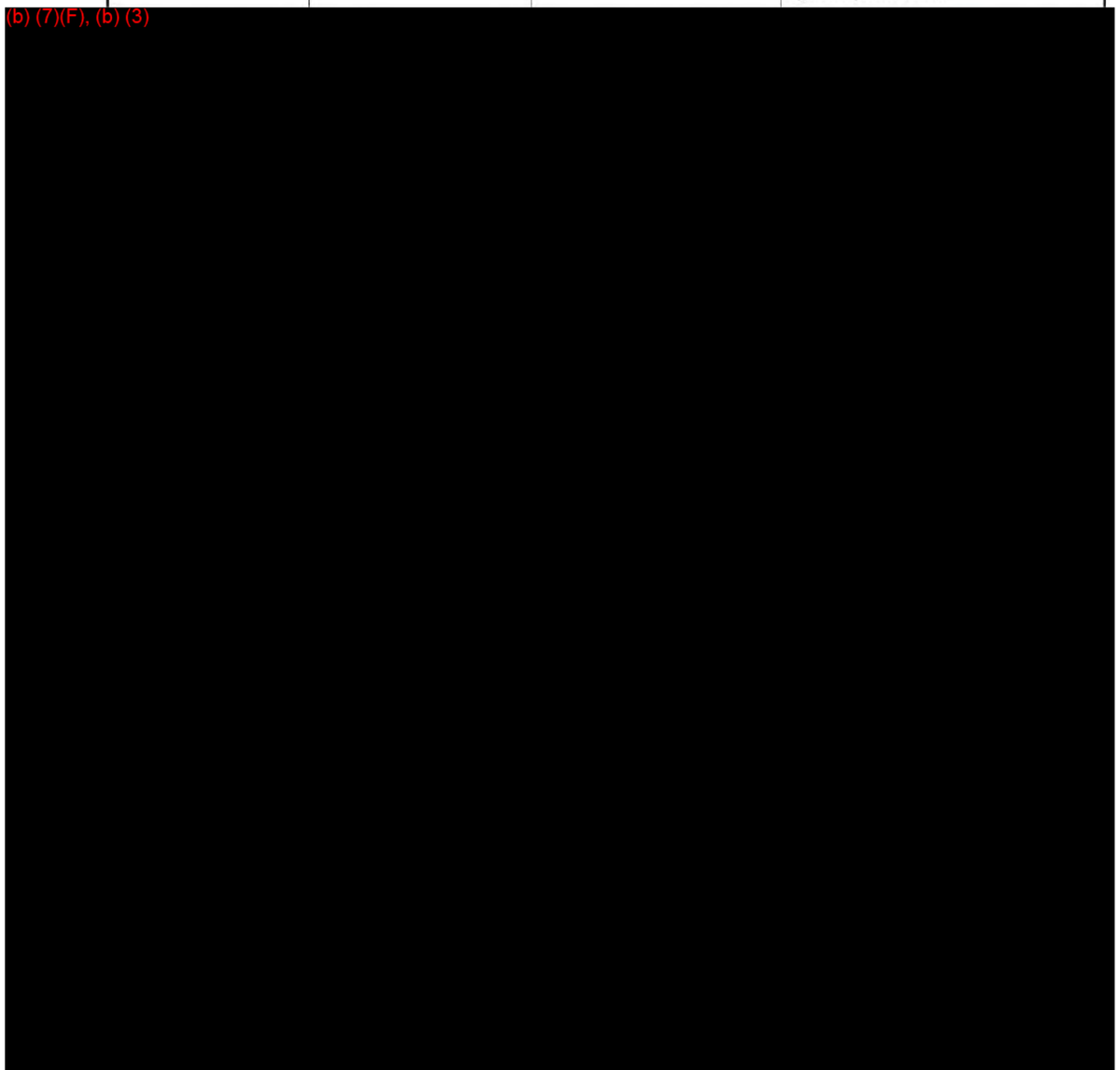
The creek is small and narrow in this area.

The site has several good channel locations upstream of paths.

River Data	Staging Areas	Base Map Containment Sites	CS 7-17 Unnamed Drainage
• Width = 1 - 3 ft. • Velocity = 0 - 2 ft./sec.	• Work Pad Near PLMP 436 • OMS 63-1 • PS 7-8	CS 7-14A CS 7-16 **CS 7-17** CS 7-18 CS 7-20 CS 7-21 CS 7-22 CS 7-23	C-Plan Map Ref. 40 Aerial Map Ref. 224 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Unnamed Drainage — CS 7-17

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
Outlet of Pond Lake into Pond Creek	N/A		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Driver - Work pad to 436.8 and walk in

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming or water dam depending on the water levels	Ice slotting or water dam in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-14A CS 7-18

III. General Site Information

Water Path:	Water Variations:
Outlet of small pond runs along the pipeline and enters Shocker Creek downstream of the site.	The creek is generally stable.

LZ Location:	Forward Staging Area:
At the site- near the pond outlet	(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS07

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Site is flat and open area at the pond outlet.	Low brush with stands of trees nearby Heavy grass around the creek banks

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	N/A

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Moose, bear, small game, waterfowl, eagle

IV. General Site Description

Site may have spongy areas around the creek inlet.

Site is approximately one-tenth of a mile off the ROW.

River Data	Staging Areas	Base Map Containment Sites			CS 7-18 Shocker Creek
• Width = 10 - 20 ft. • Velocity = 0 - 2 ft./sec.	• OMS 63-1 • Nordale Yard • PS 7	CS 7-14A **CS 7-18** CS 7-22	CS 7-16 CS 7-20 CS 7-23	CS 7-17 CS 7-21	C-Plan Map Ref. 40 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Shocker Creek CS 7-18

(b) (7)(F), (b) (3)

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Shocker Creek, approximately 2 miles from the pipeline	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	N/A

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming Water dam at narrow or low water areas	Ice slotting Water dam in open areas Oil may not make is to this site in winter.

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-14A

III. General Site Information

Water Path:	Water Variations:
Shocker Creek crosses under the pipeline above this site and continues to meander to the Chatanika River.	The creek is generally stable with low flow and stays within the banks.

LZ Location:	Forward Staging Area:
Near the old Oxbow away from the creek Sign at LZ	OMS 63-1

Nearest Pump Station/Response Base:
Fairbanks

Response Equipment On Site (Kits and major items):
Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three feet drop at normal water levels Some cut bank areas	Heavy trees with open walking areas Grasses and small brush along the bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Beaver, moose, bear, waterfowl, eagle

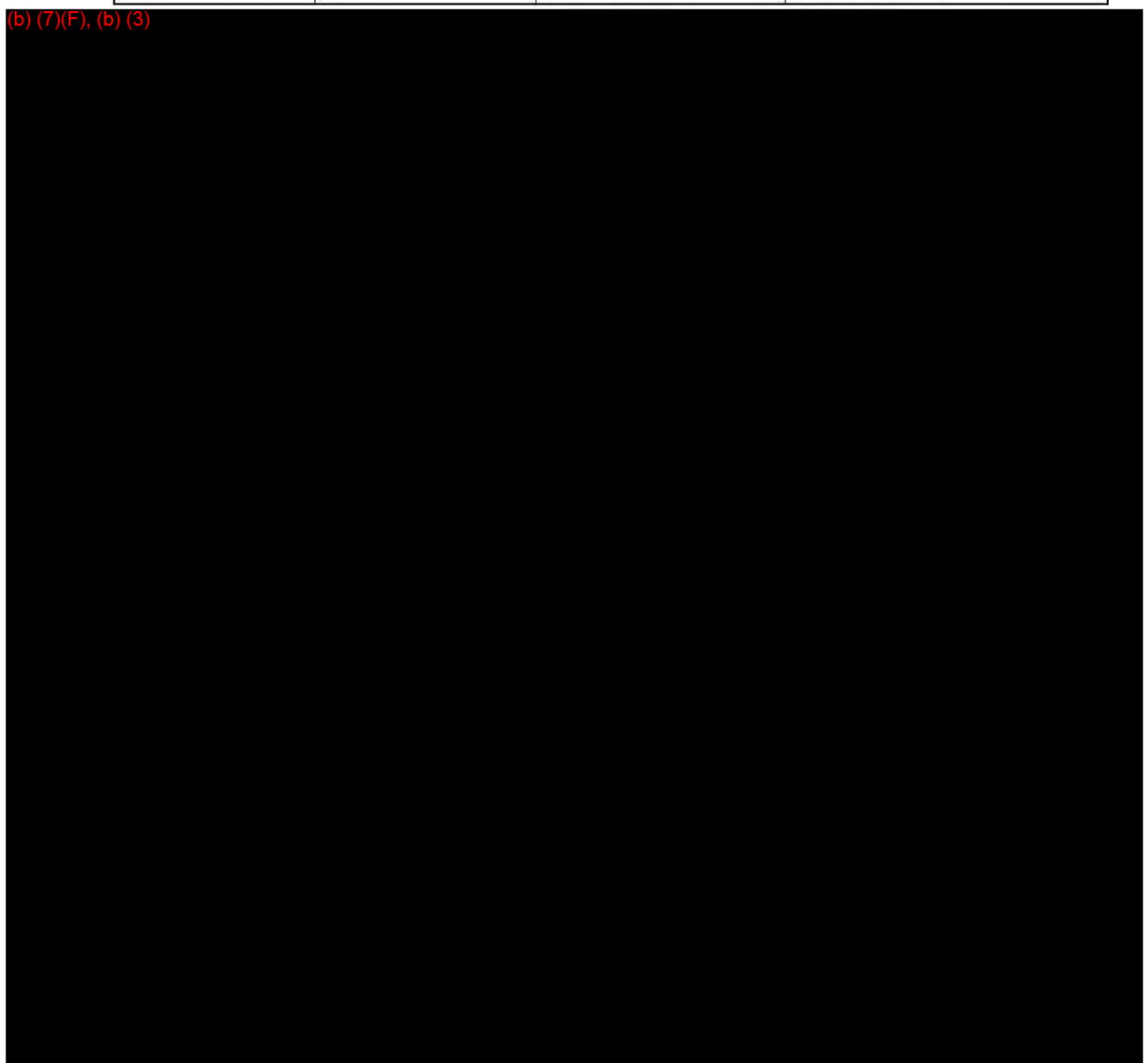
IV. General Site Description

A beaver dam is near the site.

Dead fallen trees are around the area.

River Data	Staging Areas	Base Map Containment Sites	CS 7-20 Sargent Creek
• Width = 50 - 150 ft. • Velocity = 1 - 3 ft./sec.	• OMS 63-1 • Nordale Yard • PS07	CS 7-14A CS 7-16 CS 7-17 CS 7-18 **CS 7-20** CS 7-21 CS 7-22 CS 7-23	C-Plan Map Ref. 40 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Sargent Creek — CS 7-20

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
Confluence on Sargent Creek and Chatanika River	N/A		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat - on Chatan ka River downstream of the pipeline

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming at the mouth of Sargent Creek and at the Chatanika River Water dam at low water levels	Oil may not migrate this far in winter. Booming and water dam in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-14A

III. General Site Information

Water Path:	Water Variations:
Sargent Creek flows over the pipeline upstream of the site. The creek enters the Chatanika River at this site.	The river is generally stable and is susceptible to seasonal and rain influences.

LZ Location:	Forward Staging Area:
At site- on point of land across from the creek	South bank of Chatan ka River on ROW OMS 63-1

Nearest Pump Station/Response Base:
Fairbanks

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Gradual slopes in most areas, some cut back nearby	Light Open walking areas with stands of trees nearby

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Moose, bear, small game, eagle, waterfowl

IV General Site Description

Vault Creek enters Chatanika on the other side of the river from landing zone.

Large gravel bar and landing zone to stage from at normal water levels.

River Data	Staging Areas	Base Map Containment Sites	CS 7-21 Vault Creek
• Width = 20 - 50 ft. • Velocity = 1 - 3 ft./sec.	• OMS 63-1 • PS07 • Nordale Yard	CS 7-14A CS 7-16 CS 7-17 CS 7-18 CS 7-20 **CS 7-21** CS 7-22 CS 7-23	C-Plan Map Ref. 40 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh
Water Dam	Boat Launch	Pump Station	Trees
C.S. Sign	Trail/Clearing	Aboveground Pipe	Tussock/Tundra
Tank	Water	Belowground Pipe	Sand/Gravel
Tote	LWC		
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Vault Creek CS 7-21

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
63 APL/AMS-2 crossing of Vault Creek	N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

[redacted]

Primary Access:	Secondary Access:
Drive - 1.5 miles to site. Elliott Highway to 63 APL/AMS -2	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder through the use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming Possible use of water dam in low water conditions	Ice slotting Boom in open areas

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-22 CS 7-23	CS 7-14A

III. General Site Information

Water Path:	Water Variations:
Vault Creek crosses the pipeline well upstream of the site. Creek enters the Chatan ka River just below this site.	Creek is generally stable and stays within its banks in this area.

LZ Location:	Forward Staging Area:
At site on APL or 1000 feet up the road	On 63 APL/AMS-2

Nearest Pump Station/Response Base:
Fairbanks

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Some sloped areas near the bridge. One to three feet drop in other areas	Heavy brush, trees and grasses along the stream

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

Wildlife Sensitivities: Moose, bear, small game, waterfowl, eagle

IV. General Site Description

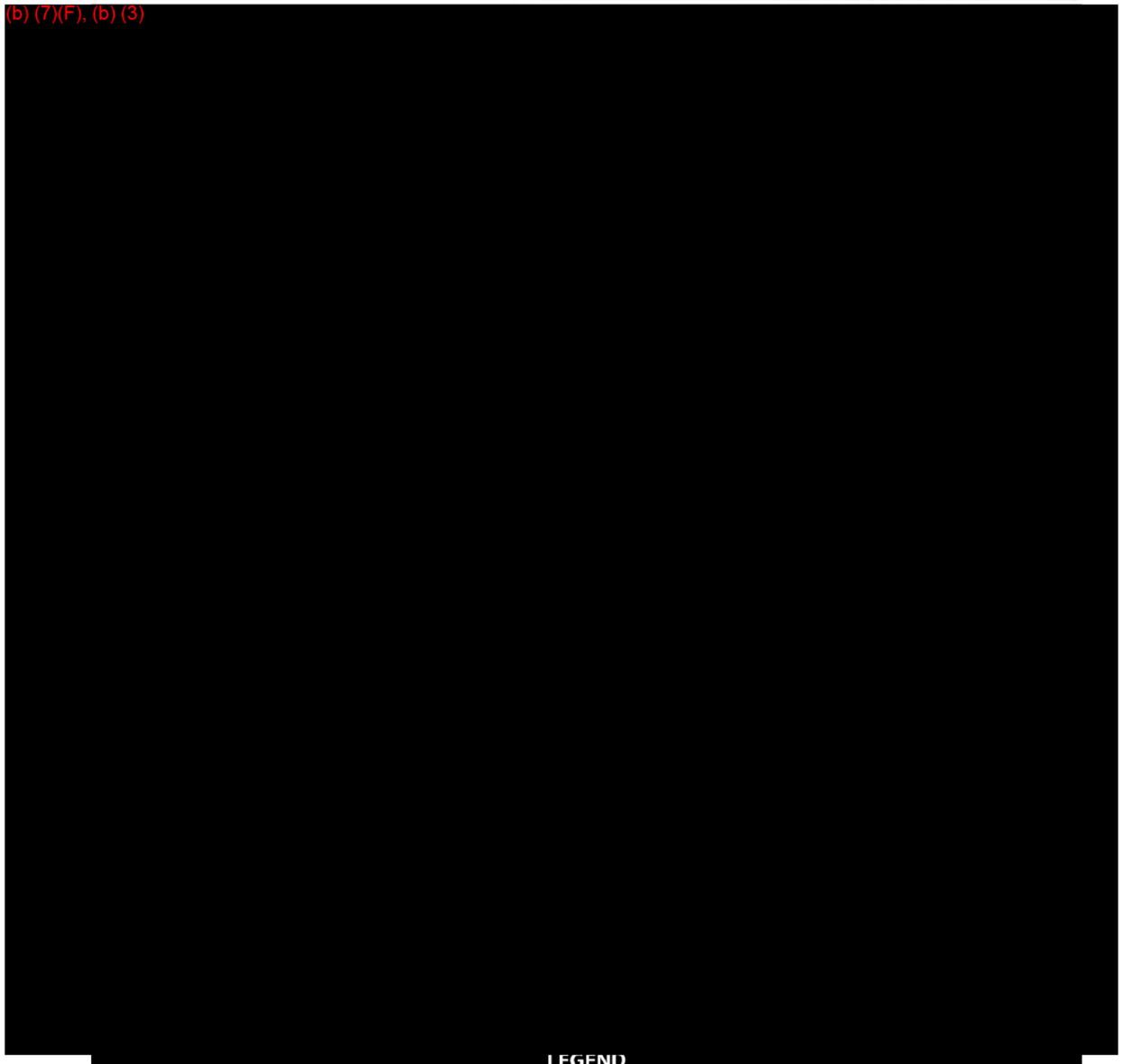
Site has flood water areas upstream.

There is good access along the banks.

Chatanika River is one-quarter of a mile downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 7-22 Vault Creek
• Width = 4 - 10 ft. • Velocity = 1 - 3 ft./sec.	• OMS 63-1 • Nordale Yard	CS 7-14A CS 7-16 CS 7-17 CS 7-18 CS 7-20 CS 7-21 **CS 7-22** CS 7-23	C-Plan Map Ref. 40 Aerial Map Ref. 227 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Vault Creek CS 7-22

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
Access road crossing of Vault Creek	N/A		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Elliot Highway to access road 62 APL-1	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam and culvert block Possible use of a small boom upstream of the site	Culvert block

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-23	CS 7-21 CS 7-14A

III. General Site Information

Water Path:	Water Variations:
Vault Creek flows into the Chatanika River well downstream.	The creek is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
At site- on access road	At site- on access road

Nearest Pump Station/Response Base:
Fairbanks

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Defined and steep, near the road/culvert	Heavy brush Trees dot the area

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

This CS is on a private mining claim.

There is an additional sign at highway/APL junction.

Flood water areas are upstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 7-23 Treasure Creek
• Width = 10 - 20 ft. • Velocity = 1 - 3 ft./sec.	• OMS 63-1 • Nordale Yard	CS 7-14A CS 7-16 CS 7-17 CS 7-18 CS 7-20 CS 7-21 CS 7-22 **CS 7-23**	C-Plan Map Ref. 40 Aerial Map Ref. 227 (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Treasure Creek CS 7-23

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Pipeline crossing of Treasure Creek	N/A (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
62 APL-1 Drive - ROW accessible and access road	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam and small booming operations	Water dam Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-22 CS 7-21 CS 7-14A

III. General Site Information

Water Path:	Water Variations:
Pipeline crosses Treasure Creek at this site. Treasure Creek flows to Vault Creek and then to Chatan ka River.	The creek is suscept ble to rain influence. The banks keep the stream defined in this area.
LZ Location: At site- on ROW	**Forward Staging Area:** (b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
Fairbanks

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Defined Some steep bank area, but the banks are stable	Heavy trees and brush except for access area

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

Wildlife Sensitivities: Moose, bear, small game, eagle

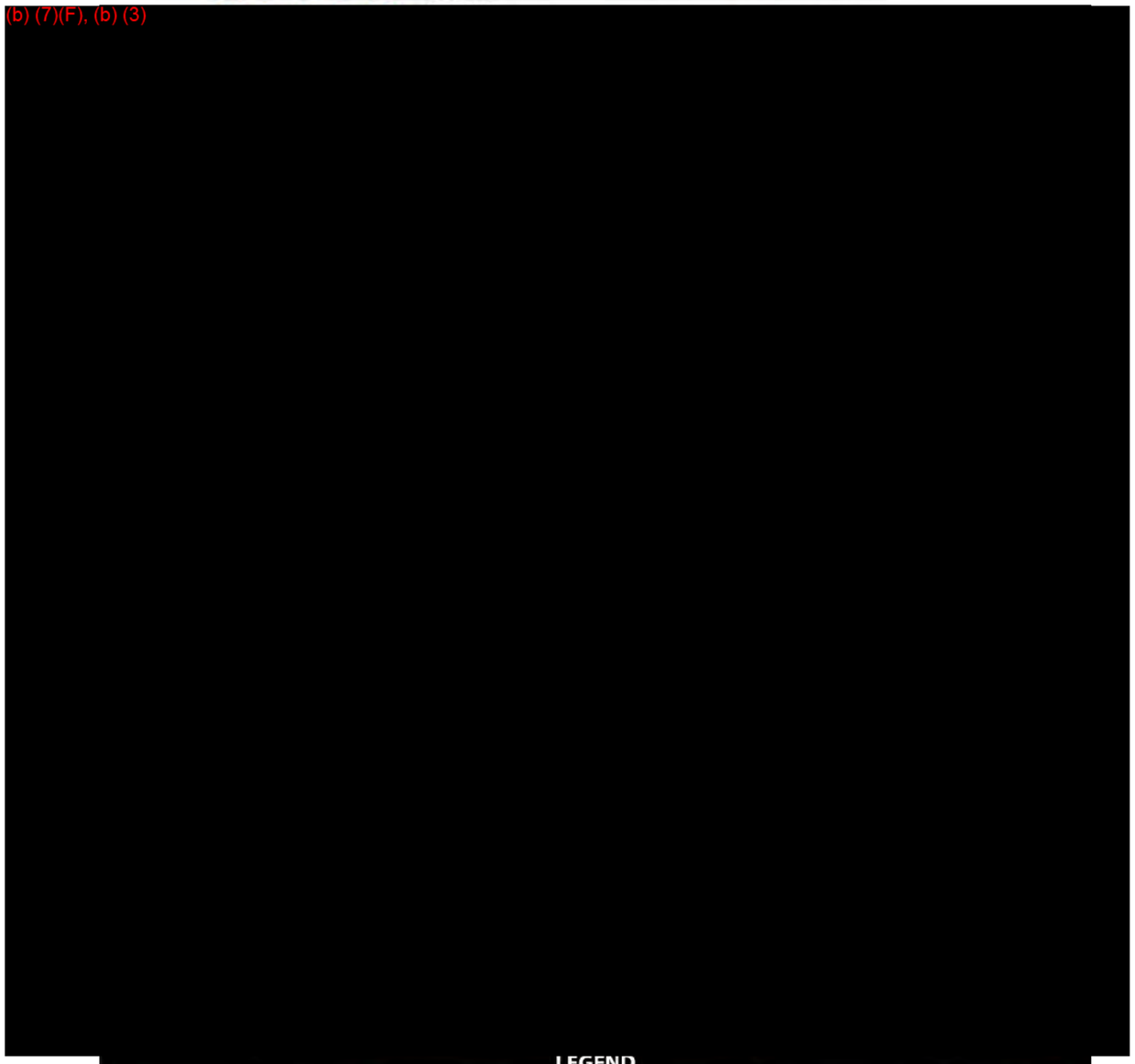
IV. General Site Description

Headache bars are on all access points at this site.

River Data	Staging Areas	Base Map Containment Sites	CS 7-25 Goldstream Creek
• Width = 10 - 30 ft. • Velocity = 1 - 3 mph.	• Ballaine Road • PS07 and PS08	**CS 7-25** CS 7-27 CS 7-27A CS 7-31	C-Plan Map Ref. 41 Aerial Map Ref. N/A (b) (7)(F), (b) (3) ted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Goldstream Creek — CS 7-25

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Ballaine Road crossing of Goldstream Creek	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - Goldstream Road to Ballaine Road	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming and water dam at sites of opportunity	Ice slotting Oil may not reach this far downstream

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-27 CS 7-27A	None

III. General Site Information

Water Path:	Water Variations:
Goldstream Creek is fed by numerous small streams above this site.	The creek is suscept ble to rain influence.

LZ Location:	Forward Staging Area:
At site	Ballaine Road

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Bank is one to three feet above normal water levels Ease of access on both sides	Grasses and brush

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, cell phone

Wildlife Sensitivities: Moose, small game, waterfowl, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-27 Goldstream Creek
• Width = 4 - 15 ft. • Velocity = 1 - 4 mph.	• Open gravel areas onsite • Nordale Yard	CS 7-25 **CS 7-27** CS 7-27A CS 7-31	C-Plan Map Ref. 41,41W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Goldstream Creek — CS 7-27

I. Site Location

Location Description:
Goldstream Creek at the gravel pits

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive - New Steese Highway to Goldstream Creek Road
In Polar Mine, check in at office.

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):
Conducts Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Water dam and culvert blocks at select points

Winter Response Tactic(s):
Culvert block
Oil may not reach this point in winter

Additional Containment Sites Above this Location:
CS 7-27 CS 7-31

Additional Containment Sites Below this Location:
CS 7-25

III. General Site Information

Water Path:
Numerous creeks enter Goldstream Creek near this site.
Site is downstream of the pipeline crossing.

Water Variations:
The creek is suscept ble to rain influence.

LZ Location:
At site- numerous gravel pits in the area

Forward Staging Area:
At site- numerous gravel pits in the area

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Good
Site has developed banks and access points at numerous locations.

Vegetation Conditions at Site:
None in the area of the site

Location of Nearest Initial Helicopter Refueling Point:
Fairbanks

Utilize Additional Response Resources from:
N/A

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

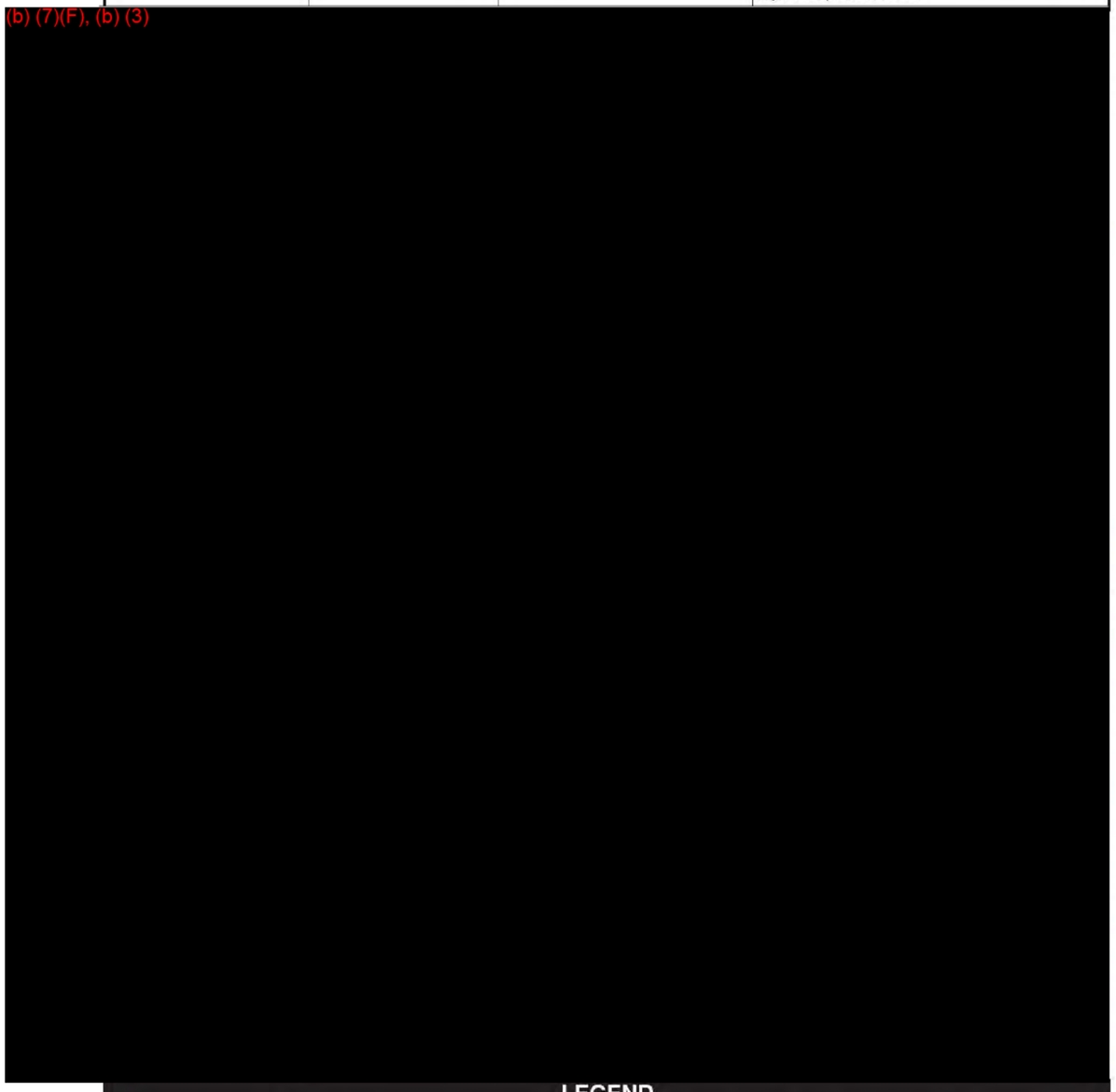
Wildlife Sensitivities: eagle, waterfowl.

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-27A Goldstream Creek
• Width = 8 ft. - 20 ft. • Velocity = 1 - 4 ft./sec.	• Local Gravel Pit • Nordale Yard	CS 7-25 CS 7-27 **CS 7-27A** CS 7-31	C-Plan Map Ref. 41 Aerial Map Ref. 230 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Goldstream Creek — CS 7-27A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Goldstream Road crossing of Goldstream Creek	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - New Steese Highway to Goldstream Road	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming with water dam at low water levels	Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-27 CS 7-25

III. General Site Information

Water Path:	Water Variations:
Goldstream Creek flows under the pipeline just upstream of the site.	The creek is suscept ble to rain and seasonal influences but normally stays within its banks.
LZ Location: At site or nearby gravel pit	**Forward Staging Area:** Numerous gravel pits in the area

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gradual slope with low transition	Brush Site has numerous access areas upstream
Location of Nearest Initial Helicopter Refueling Point: Fairbanks	**Utilize Additional Response Resources from:** Nordale Yard

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

Wildlife Sensitivities: Moose, bear, waterfowl, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-31 Engineer Creek
• Width = 5 - 15 ft. • Velocity = 1 - 4 mph.	• Nordale Yard • Highway Pullout • Pipeline Work Pad	CS 7-25 CS 7-27 CS 7-27A **CS 7-31**	C-Plan Map Ref. 41 Aerial Map Ref. 221 (b) (7)(F), (b) (3) mitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · CS C.S. Sign · Tank · T Tote · C Conex · Boom · Boom Vane · P Pump · S Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Engineer Creek — CS 7-31

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Engineer Creek crossing of the pipeline

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive - access via Steese Highway Visitors Center at pipe crossing, then south

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):
Water dam

Winter Response Tactic(s):
Water dam
Ice slotting

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 7-27 CS 7-27

III. General Site Information

Water Path:
Engineer Creek flows alongside pipeline.

Water Variations:
The creek is suscept ble to rain influence, and there are some overflow areas.

LZ Location:
At site- ROW

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Gradual
Good soils with gentle slopes

Vegetation Conditions at Site:
Small trees and brush along the stream banks

Location of Nearest Initial Helicopter Refueling Point:
Fairbanks

Utilize Additional Response Resources from:
Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Eagle, small game, moose

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-32 Chena River
• Width = 100 - 300 ft. • Velocity = 1 - 4 mph.	• Golf Course Parking Lot	**CS 7-32** CS 7-33 CS 7-33A CS 7-34	C-Plan Map Ref. 42, 42W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Chena River

CS 7-32

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Tank Road crossing of Chena River	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - Tank Road via Ft. Wainwright	Boat - Chena River

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom sites at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	Diversion and containment booming Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 7-33A CS 7-34 CS 7-33

III. General Site Information

Water Path:	Water Variations:
Chena River meanders through Ft. Wainwright	The creek is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
At site- public golf course	At golf course and public access areas

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Site has gentle slopes and numerous access points	Brush and grasses

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Waterfowl, eagle

IV. General Site Description

A golf course is alongside the river.

River Data	Staging Areas	Base Map Containment Sites	CS 7-33 Chena River
• Width = 200 - 300 ft. • Velocity = 1 - 3 ft./sec.	• Nordale • On-Site Snow Dump	CS 7-32 **CS 7-33** CS 7-33A CS 7-34	C-Plan Map Ref. 42W [redacted] Contact AK SC Land Legal for permitted legal description of this site.

North

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Chena River

CS 7-33

I. Site Location

[redacted]

Location Description:	Nearest Pipeline MP:	GPS Coordinates:
Chena River near the municipal snow dump	N/A	[redacted]

Primary Access:	Secondary Access:
Drive – Glacier Avenue to Hamilton Avenue to Hamilton Acres Park	Helicopter or boat access available

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Establish recovery, storage, transfer systems and procedures at containment sites.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming with possible use of diversion booms at high water	Containment booming in open areas Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-33A, CS 7-32	CS 7-34

III. General Site Information

Water Path:	Water Variations:
Chena River is a drainage for several streams that cross the pipeline. This section is just west of Ft. Wainwright and the beginning portion of the Fairbanks area contact.	There is some variation in depth but river is well defined in this area. The river is suscept ble to seasonal and rain influences, but current speed is generally consistent.
LZ Location: At municipal snow dump nearby	**Forward Staging Area:** Many neighborhood roads in the area Hamilton

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Defined banks, open areas with park nearby and several access points above and below the site	Generally open due to public access. Some large trees and brush along the bank in areas
Location of Nearest Initial Helicopter Refueling Point: Fairbanks Airport	**Utilize Additional Response Resources from:** Nordale yard

Communications Resources Available:
Cell phone, ARTS, VHF

Wildlife Sensitivities: Waterfowl, eagle

IV. General Site Description

Site is on the outer bend near the municipal snow dump. There is a large slough that can act as a containment area at the site. Additional open areas allow for staging area to be set up onsite so support areas of opportunity nearby.

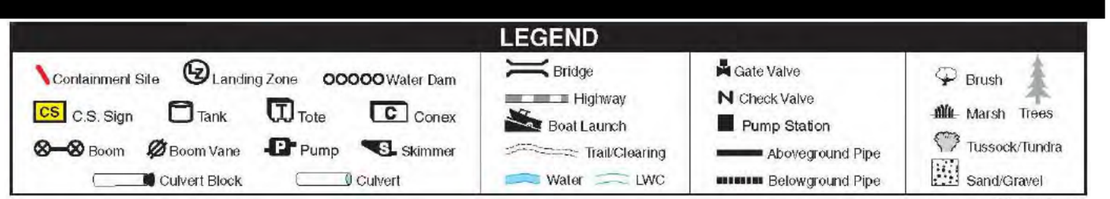
Numerous residences are in the area that back up on the river.

River Data	Staging Areas	Base Map Containment Sites	CS 7-33A Chena River
• Width = 200 - 600 ft. • Velocity = 2 - 4 ft./sec.	• Nordale Yard • At scene roadways	CS 7-32 CS 7-33 CS 7-33A CS 7-34	C-Plan Map Ref. 42W Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]



Not to Scale

Alyeska pipeline

Chena River

CS 7-33A

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Chena River	N/A	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Drive - Gaffney Road to River Road	Boat - Chena River to Fegree Road Launch

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy deflection boom to divert oil to containment and recovery areas.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	Diversion and containment booming Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-32	CS 7-33 CS 7-34

III. General Site Information

Water Path:	Water Variations:
Chena River flows between Ft. Wainwright and Fairbanks in this area.	The river is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
At site	Multiple locations near the site

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex, Boom (Some equipment stored at Nordale OSCP Building. See Vol. 1, Section 3.6 for details.)

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Site is public boat launch and has several access points	Grass and brush with open access to the river bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks	Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, waterfowl, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-34 Chena River
• Width = 200 ft. - 300 ft. • Velocity = 3 - 6 ft./sec.	• Hotel Side Lot • Chena Small Tracts Road	CS 7-32 CS 7-33 CS 7-33A **CS 7-34**	C-Plan Map Ref. 42W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | CS Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Chena River

CS 7-34

I. Site Location

(b) (7)(F), (b) (3)

Location Description:		Nearest Pipeline MP:	GPS Coordinates:
Chena River		N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - Airport Way to Pikes Landing Road	Boat - Chena River upstream launch

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage, and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom sites at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	Diversion and containment booming Ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 7-32 CS 7-33A CS 7-33	None

III. General Site Information

Water Path:	Water Variations:
Chena River flows past the Princess Hotel at this site.	River is generally stable but is susceptible to seasonal and rain influences.

LZ Location:	Forward Staging Area:
N/A	Hotel parking lot

Nearest Pump Station/Response Base:
Nordale Yard

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable The banks are populated by business and private locations.	Brush and shrubs, but many open areas

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks airport	Nordale Yard

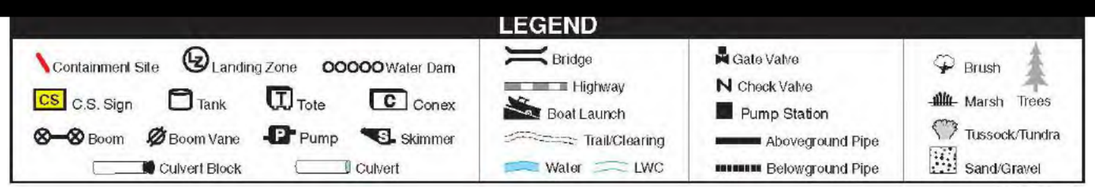
Communications Resources Available:
VHF, ARTS, cell phone, satellite phone

Wildlife Sensitivities: Waterfowl, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-36 Moose Creek
• Width = 20 ft. - 50 ft. • Velocity = 1 - 3 mph.	• On-site yard area • PS 7	**CS 7-36** CS 7-37 CS 7-38 CS 7-39 CS 7-40 CS 7-41 CS 7-42	C-Plan Map Ref. 43 Aerial Map Ref. 243 (b) (7)(F), (b) (3) permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Moose Creek — CS 7-36

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Moose Creek crossing of the pipeline

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Diversion and deflection booming

Winter Response Tactic(s):
Diversion and deflection booming
Ice slotting

Additional Containment Sites Above this Location:
CS 7-38 CS 7-39
CS 7-40 CS 7-41
CS 7-42

Additional Containment Sites Below this Location:
CS 7-37

III. General Site Information

Water Path:
Moose Creek crosses over the pipeline at this site and enters Pile Driver Slough just below.

Water Variations:
The creek is suscept ble to rain and seasonal influences.

LZ Location:
On work pad at the site

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable
Railroad, highway and pipeline all have ROW in the area

Vegetation Conditions at Site:
Heavy grass
Some brush but open walking areas along the bank

Location of Nearest Initial Helicopter Refueling Point:
Fairbanks/Delta Junction

Utilize Additional Response Resources from:
PS09
Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 7-37 Piledriver Slough
• Width = 10 - 40 ft. • Velocity = 1 - 6 mph.	• PS 7	CS 7-36 CS 7-39 CS 7-42	CS 7-37 CS 7-40	CS 7-38 CS 7-41	C-Pan Map Ref. 43, 43W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Piledriver Slough — CS 7-37

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Nearest Pipeline MP:	GPS Coordinates:
N/A	(b) (7)(F), (b) (3) ,

Primary Access:	Secondary Access:
Drive - access via levee roads	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	Containment booming

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 7-36	CS 7-39	None
CS 7-41	CS 7-38	
CS 7-40	CS 7-42	

III. General Site Information

Water Path:	Water Variations:
Pile Driver Slough enters the Tanana River below this site.	The creek is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
Levee at site	On levee- system nearby

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Site is on levee-reinforced bank with a four to eight-foot slope to the water.	Open areas all along the levee

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Fairbanks/Delta Junction	PS09 Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 7-38 Moose Creek
• Width = 20 - 50 ft. • Velocity = 1 - 3 ft./sec.	• PS 7 & 8 (b) (7)(F), (b) (3) [redacted]	CS 7-36 CS 7-39 CS 7-42	CS 7-37 CS 7-40	CS 7-38 CS 7-41	C-Plan Map Ref. 43 Aerial Map Ref. 244 (b) (7)(F), (b) (3) [redacted] legal description of this site.

North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Moose Creek — CS 7-38

I. Site Location

(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates: (b) (7)(F), (b) (3) [redacted]

Drive - ROW accessible	**Secondary Access:** Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom sites at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	**Winter Response Tactic(s):**
Diversion and containment booming	Ice slotting Diversion and containment booming
Additional Containment Sites Above this Location: CS 7-39 CS 7-41 CS 7-40 CS 7-42	**Additional Containment Sites Below this Location:** CS 7-36 CS 7-37

III. General Site Information

Water Path:	**Water Variations:**
Moose Creek crosses over the pipeline at this site. The creek enters the Tanana River over two miles downstream.	The creek is suscept ble to seasonal and rain influences.
LZ Location: At site	**Forward Staging Area:** (b) (7)(F), (b) (3) [redacted]
Nearest Pump Station/Response Base: PS08	
Response Equipment On Site (Kits and major items): None	
Stream Bank Conditions at Site: Stable Sloped to water's edge with one to three-foot drop at normal water levels.	**Vegetation Conditions at Site:** Heavy Grasses and brush along the stream bank.
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:** PS09
Communications Resources Available: VHF, ARTS, satellite phone, cell phone	
Wildlife Sensitivities: Moose, bear, small game, eagle	

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-39 Moose Creek
• Width = 10 - 30 ft. • Velocity = 1 - 3 ft./sec.	• Transmitter Road • PS 7 & 8	CS 7-36 CS 7-37 CS 7-38 **CS 7-39** CS 7-40 CS 7-41 CS 7-42	C-Plan Map Ref. 43 Aerial Map Ref. 245 (b) (7)(F), (b) (3) legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site	Landing Zone	Water Dam	Bridge
CS C.S. Sign	Tank	T Tote	C Conex	Highway
Boom	Boom Vane	P Pump	S Skimmer	Boat Launch
Culvert Block	Culvert		Trail/Clearing
			Water LWC
Gate Valve	Brush	
N Check Valve	Marsh Trees	
Pump Station	Tussock/Tundra	
Aboveground Pipe	Sand/Gravel	
Belowground Pipe		

Not to Scale

Alyeska pipeline SERVICE COMPANY

Moose Creek CS 7-39

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Transmitter Road crossing of Moose Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive - via Eielson AFB

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom sites at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Diversion and containment booming

Winter Response Tactic(s):
Ice slotting
Diversion and containment booming

Additional Containment Sites Above this Location:
CS 7-40 CS 7-42
CS 7-41

Additional Containment Sites Below this Location:
CS 7-36 CS 7-37
CS 7-37

III. General Site Information

Water Path:
Pipeline crosses Moose Creek just upstream of the site.
Moose Creek crosses back and forth over the pipeline below this site.

Water Variations:
The creek is suscept ble to seasonal and rain influences.

LZ Location:
At site

Forward Staging Area:
Along transmitter road

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable
One to three-foot drop at normal water levels.

Vegetation Conditions at Site:
Heavy grasses and brush
Trees are above and below this site

Location of Nearest Initial Helicopter Refueling Point:
Delta Junction

Utilize Additional Response Resources from:
PS09
Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 7-40 French Creek
• Width = 10 - 30 ft. • Velocity = 1 - 3 ft./sec.	• Work pad near PLMP 474 • PS 7	CS 7-36 CS 7-37 CS 7-38 CS 7-39 **CS 7-40** CS 7-41 CS 7-42	C-Plan Map Ref. 43 Aerial Map Ref. 245 (b) (7)(F), (b) (3) Contact AK SC Land Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

French Creek — CS 7-40

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Pipeline crossing of French Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive - ROW accessible

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Establish deflection and containment boom sites at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Diversion and containment booming

Winter Response Tactic(s):
Ice slotting
Diversion and containment booming

Additional Containment Sites Above this Location:
CS 7-41 CS 7-42

Additional Containment Sites Below this Location:
CS 7-39 CS 3-37
CS 7-38 CS 7-36

III. General Site Information

Water Path:
French Creek passes under the pipeline at this site and enters Moose Creek shortly downstream.

Water Variations:
The creek is suscept ble to seasonal and rain influences.

LZ Location:
At site

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable
One to three-foot drop at normal water levels.

Vegetation Conditions at Site:
Heavy trees, brush and grasses along the creek bank

Location of Nearest Initial Helicopter Refueling Point:
Delta Junction

Utilize Additional Response Resources from:
PS09
Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

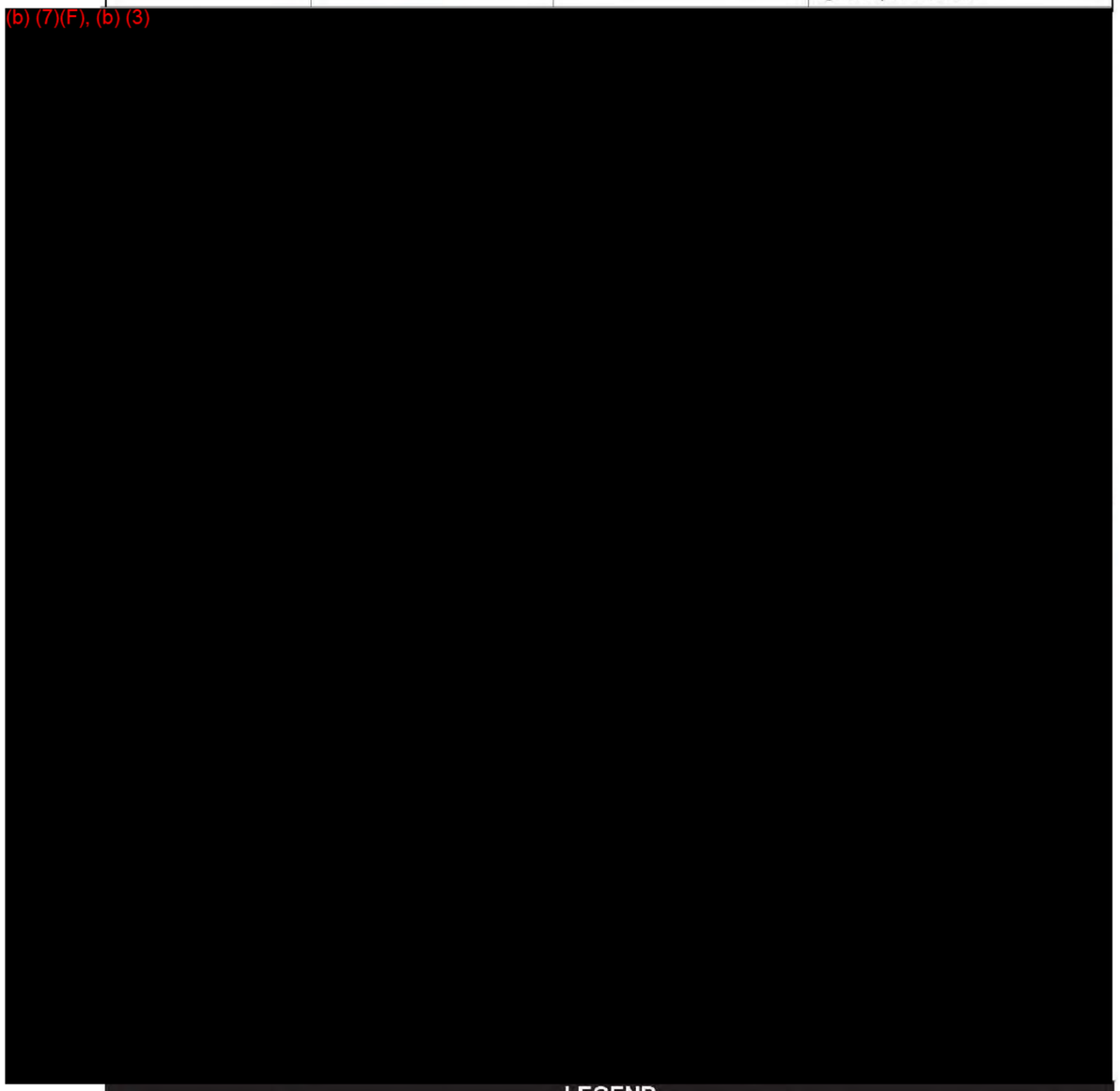
Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 7-41 French Creek
• Width = 40 - 80 ft. • Velocity = 1 - 4 ft./sec.	• Manchu Road • Eielson AFB	CS 7-36 CS 7-39 CS 7-42	CS 7-37 CS 7-40	CS 7-38 **CS 7-41**	C-Plan Map Ref. 43 Aerial Map Ref. 246 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

French Creek — CS 7-41

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Manchu Road crossing of French Creek	N/A	N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive - via Eielson AFB	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	Diversion and containment booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:	
CS 7-42	CS 7-36 CS 7-39	CS 7-38 CS 7-40

III. General Site Information

Water Path:	Water Variations:
French Creek and tr butaries pass over the pipeline several times above and below this site.	The creek is suscept ble to rain influence.

LZ Location:	Forward Staging Area:
At site	Manchu Road

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three-foot drop	Heavy brush and grasses along the bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09 Nordale Yard

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 7-42 French Creek @ Quarry Road
• Width = 10 - 30 ft. • Velocity = 1 - 4 ft./sec.	• Quarry Road • PS 7 • Eielson AFB	CS 7-36 CS 7-39 **CS 7-42**	CS 7-37 CS 7-40	CS 7-38 CS 7-41	C-Plan Map Ref. 43 Aerial Map Ref. 248 (b) (7)(F), (b) (3) Contact Alyeska Land Dept. for permitted legal description of this site. North

(b) (7)(F), (b) (3)

[redacted]

Alyeska pipeline SERVICE COMPANY

French Creek

CS 7-42

(b) (3), (b) (7)(F)

[redacted]

LEGEND

Containment Site Landing Zone Water Dam C.S. Sign Tank Tote Conex Boom Boom Vane Pump Skimmer Culvert Block Culvert	Bridge Highway Boat Launch Trail/Clearing Water LWC	Gate Valve Check Valve Pump Station Aboveground Pipe Belowground Pipe	Brush Marsh Trees Tussock/Tundra Sand/Gravel

Not to Scale

River Data	Staging Areas	Base Map Containment Sites	CS 8-1 Little Salcha River
• Width = 20 ft. - 60 ft. • Velocity = 1 - 3 ft./sec.	(b) (7)(F), (b) (3) [redacted]	CS 8-1 CS 8-2 CS 8-3 CS 8-4	C-Plan Map Ref. 44 Aerial Map Ref. N/A (b) (7)(F), (b) (3) [redacted] Contact APSC Land Dept. for permitted legal description of this site.

North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert

Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC

Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe

Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Little Salcha River — CS 8-1

I. Site Location

(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

Nearest Pipeline MP:	GPS Coordinates:
/A	(b) (7)(F), (b) (3) [redacted]

Secondary Access:
Boat- Tanana River to Little Salcha River

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage, and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming	Containment booming Possible use of ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 8-2 CS 8-3 CS 8-4	None

III. General Site Information

Water Path:	Water Variations:
Little Salcha River and small drainages cross the pipeline well upstream. This site is just above Tanana River confluence.	The river is suscept ble to seasonal flooding and rain influences.

LZ Location:	Forward Staging Area:
N/A	(b) (7)(F), (b) (3) [redacted]

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Gentle slope Several access points Some steep areas	Heavy Tress, brush and grasses along the bank.

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09

Communications Resources Available:
VHF, ARTS, CB, cell phone

Wildlife Sensitivities: Bear, moose, small game, eagle, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-2 Unnamed Creek
• Width = 3 ft. - 10 ft. • Velocity = 0 - 2 ft./sec.	• PS08	CS 8-1 **CS 8-2** CS 8-3 CS 8-4	C-Plan Map Ref. 44 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Alyeska pipeline SERVICE COMPANY

Unnamed Creek CS 8-2

I. Site Location

Location Description:	Nearest Highway MP:	Nearest Pipeline MP:	GPS Coordinates:
Near the confluence of Unnamed Creek and the Salcha River	N/A	(b) (7)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	N/A

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam	Oil may not migrate this far

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 8-1

III. General Site Information

Water Path:	Water Variations:
Unnamed Creek crosses the pipeline upstream of this site, and the creek enters the Little Salcha River downstream from the site.	The creek is stable and appears to stay in defined banks.

LZ Location:	Forward Staging Area:
At site	PS08 lower yard

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):

1 Enhanced Standard Conex, Sandbags, Berm Liner, Lumber
This equipment is stored in the lower yard at PS08.

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three-foot drop to water at normal levels	Heavy grasses and brush on the bank Trees around LZ

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09

Communications Resources Available:
VHF, ARTS, CB

Wildlife Sensitivities: Moose, bear, small game, eagle, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-3 Little Salcha River
• Width = 10 ft. - 20 ft. • Velocity = 1 - 2 ft./sec.	• PS08	CS 8-1 CS 8-2 **CS 8-3** CS 8-4	C-Plan Map Ref. 44 Aerial Map Ref. 254 (b) (7)(F), (b) (3) [redacted] legal description of this site.

North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Little Salcha River — CS 8-3

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Little Salcha River	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	N/A

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming	Ice slotting Oil may not migrate this far due to the distance from the pipeline

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 8-4	CS 8-1

III. General Site Information

Water Path:	Water Variations:
Little Salcha River flows under the pipeline upstream of this site.	The river is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
At site	PS08

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three-foot drop to water at normal levels	Heavy Trees, brush, and grass on river bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09

Communications Resources Available:
VHF, ARTS

Wildlife Sensitivities: Moose, bear, small game, eagle, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-4 Gnat Creek
• Width = 3 ft. - 10 ft. • Velocity = 0 - 2 ft./sec.	• PS 8 • Work Pad PLMP 491	CS 8-1 CS 8-2 CS 8-3 CS 8-4	C-Plan Map Ref. 44 Aerial Map Ref. 255 (b) (7)(F), (b) (3) Contact APSC Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gnat Creek — CS 8-4

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Gnat Creek confluence with Salcha River	N/A	(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	Boat- upstream of Salcha River

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam Containment boom at high water	Oil may not migrate this far due to the distance from the pipeline

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 8-3, CS 8-1

III. General Site Information

Water Path:	Water Variations:
Gnat Creek crosses the pipeline and flows into the Salcha River just below this site.	The creek is generally stable but is susceptible to rain influences.

LZ Location:	Forward Staging Area:
At site	PS08

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
Sorbent boom tote, Underflow Dam Kt

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three-foot drop from the grass bank at normal water levels	Heavy Small trees and rush along the banks

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09

Communications Resources Available:
VHF, ARTS

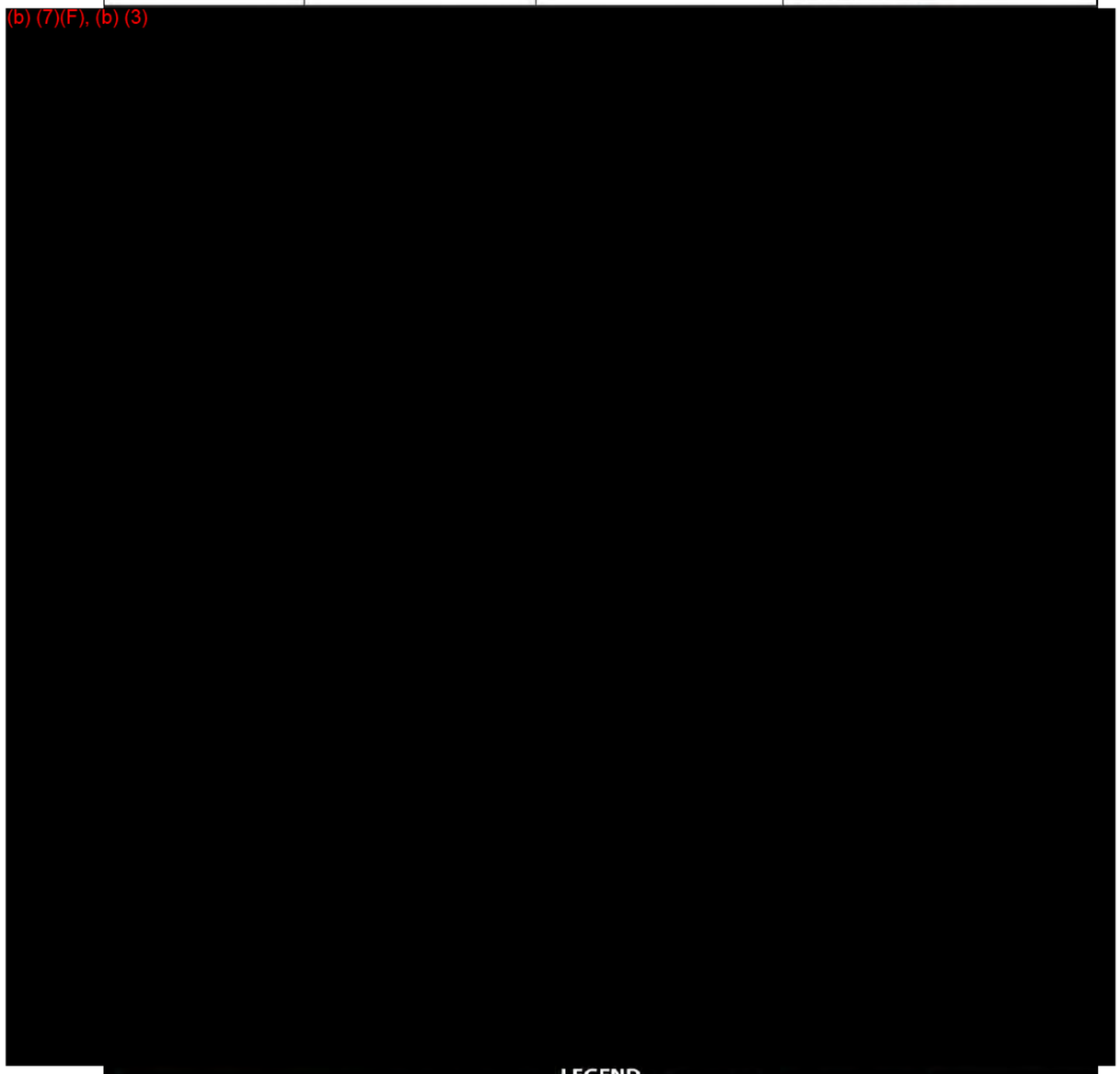
Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-5 Salcha River
• Width = 250 - 300 ft. • Velocity = 1 - 3 ft./sec.	• Salcha Boat Launch • PS08	CS 8-5 CS 8-6 CS 8-6A	C-Plan Map Ref. 44, 45W Aerial Map Ref N/A (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Salcha River

CS 8-5

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Nearest Pipeline MP:	GPS Coordinates:
N/A	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- Access from the Richardson Highway	Boat- Salcha River from up or downstream

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom sites at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming Ice slotting

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 8-6	CS 8-6A	None
CS 8-7	CS 8-7A	
CS 8-8	CS 8-9	

III. General Site Information

Water Path:	Water Variations:
The Salcha River enters the Tanana River just downstream of this site.	The river is suscept ble to seasonal flooding and rain influences.
LZ Location: In the parking area near the boat launch	**Forward Staging Area:** In the parking area near the boat launch

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open and accessible on both sides Gravel with a gradual slope	Heavy trees and brush way from the site Open all around area launch
Location of Nearest Initial Helicopter Refueling Point: Delta Junction	**Utilize Additional Response Resources from:** N/A

Communications Resources Available:
VHF, ARTS, CB, cell phone

Wildlife Sensitivities: Moose, eagle, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-6 Skinny Creek
• Width = 1 - 6 ft. • Velocity = 0 - 2 ft./sec.	• Pipeline Work Pad • PS 8	CS 8-5 **CS 8-6** CS 8-6A	C-Plan Map Ref. 44 Aerial Map Ref. 257, 258 (b) (7)(F), (b) (3) Contact AK SC Land Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Trees · Marsh · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Skinny Creek CS 8-6

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
Confluence of Skinny Creek and Salcha River	N/A		(b) (7)(F), (b) (2)

Primary Access:	Secondary Access:
Helicopter	Boat- Salcha River to Skinny Creek

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.

Deploy recovery and transfer systems at associated containment sites.

Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam Booming at the mouth of the creek and confluence with the Salcha River	Does not appear to flow

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 8-5 is several miles downstream

III. General Site Information

Water Path:	Water Variations:
Drainage flows under the pipe and approximately 0.4 miles overland to the site at the confluence of Skinny Creek and the Salcha River.	The creek and river are susceptible to rain influences.

LZ Location:	Forward Staging Area:
At site	(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gradual slope to Salcha River Some mud bank	Heavy trees and shrubs in the area

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09 Nordale Yard

Communications Resources Available:
VHF, ARTS, CB

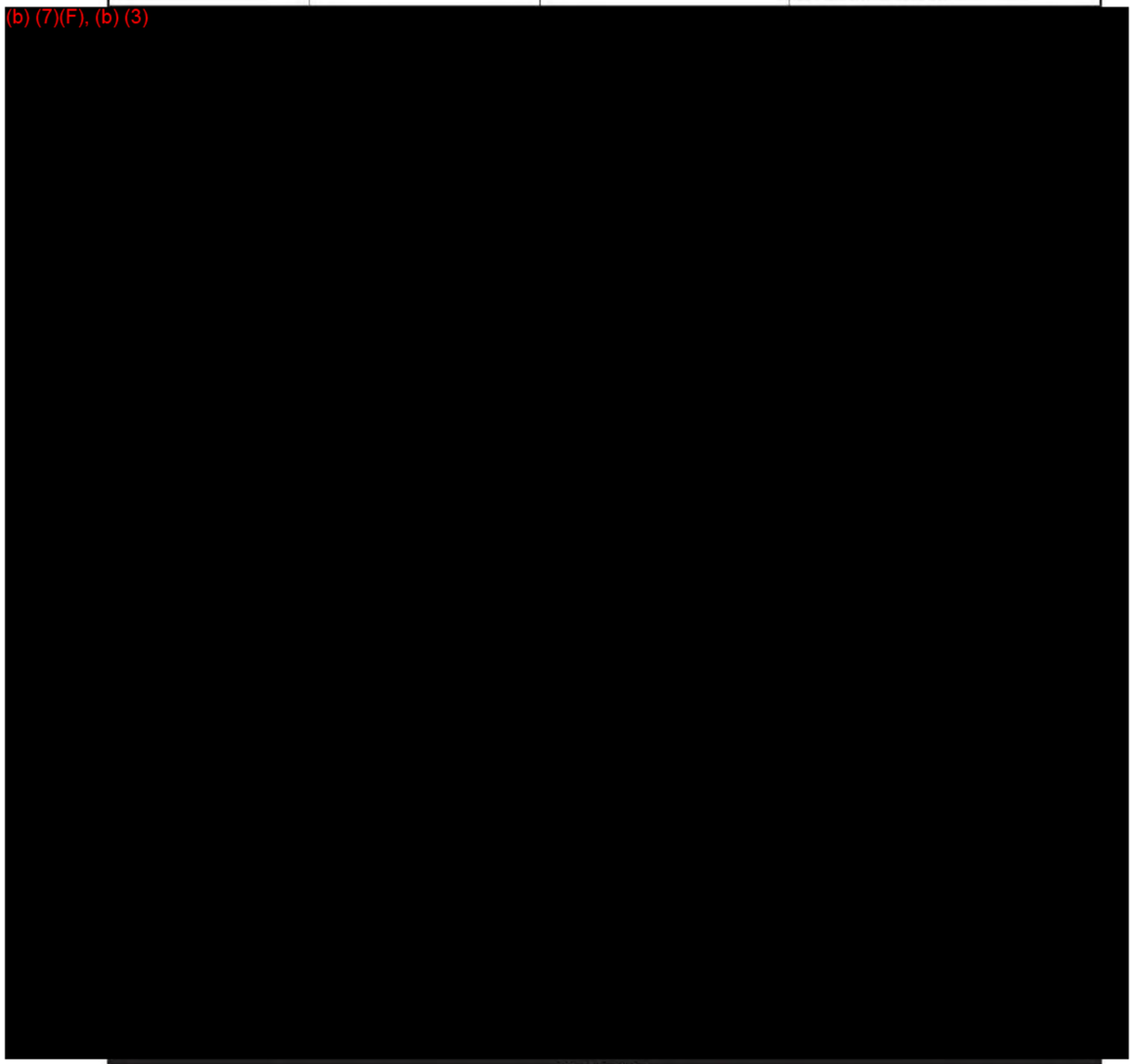
Wildlife Sensitivities: Moose, bear, small game, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-6A Salcha River
• Width = 250 - 300 ft. • Velocity = 1 - 3 ft./sec.	• Pipeline Work Pad • PS 8	CS 8-5 CS 8-6 **CS 8-6A**	C-Plan Map Ref. 44 Aerial Map Ref. 257, 258 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Salcha River — CS 8-6A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Pipeline crossing of the Salcha River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive- Row accessible

Secondary Access:
Boat

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom sites at areas of opportunity near the river bank.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):
Deflection and containment booming

Winter Response Tactic(s):
Deflection and containment booming
Ice slotting at selected sites of opportunity

Additional Containment Sites Above this Location:
CS 8-7 CS 8-8
CS 8-7A CS 8-9

Additional Containment Sites Below this Location:
CS 8-5 is located several miles downstream

III. General Site Information

Water Path:
Salcha River is fed by several small streams directly off the pipeline.

Water Variations:
The river is suscept ble to seasonal and rain influences.

LZ Location:
On ROW

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:
Stable
Gravel bank with some steep areas but generally accessible
Open gravel bars in the area

Vegetation Conditions at Site:
Heavy
Trees along ROW
Shoreline is accessible

Location of Nearest Initial Helicopter Refueling Point:
Delta Junction

Utilize Additional Response Resources from:
PS09
Nordale Yard

Communications Resources Available:
VHF, ARTS, CB

Wildlife Sensitivities: Moose, bear, small game, waterfowl

IV. General Site Description

River Data	(b) (7)(F), (b) (3)	Base Map Containment Sites	CS 8-7 Redmond Creek
• Width = 20 ft. - 50 ft. • Velocity = 1 - 3 ft./sec.		CS 8-6 CS 8-6A **CS 8-7** CS 8-7A CS 8-8 CS 8-9	C-Plan Map Ref. 44, 44E Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Redmond Creek — CS 8-7

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
Redmond Creek	N/A		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helicopter	Boat from Salcha River

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Water dam at low water levels or select location near the site	Containment booming Water dam Possible ice slotting

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 8-6A

III. General Site Information

Water Path:	Water Variations:
Redmond Creek crosses the pipeline upstream of the site, and flows into the Salcha River downstream of this site.	The creek is generally stable but could receive .some backflow from Salcha River.

LZ Location:	Forward Staging Area:
At site	OMS 53-2

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
Portable MegaSecur Dams stored at PS09 due to seasonal flooding

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three-foot banks	Heavy Trees located around the site

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09 Nordale Yard

Communications Resources Available:
VHF, ARTS

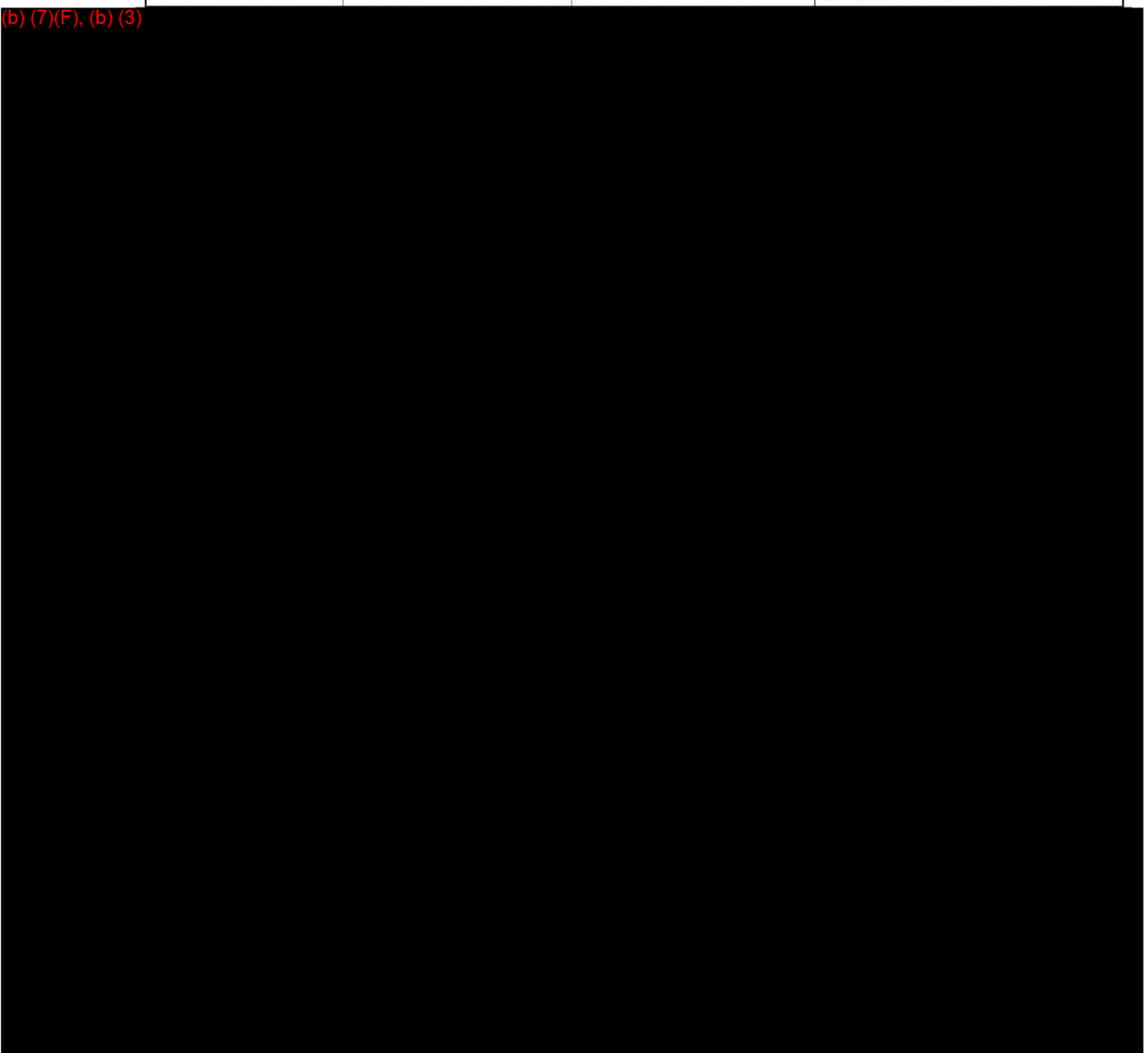
Wildlife Sensitivities: Moose, bear, small game, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-7A McCoy Creek
• Width = 20 ft. - 60 ft. • Velocity = 1 - 3 ft./sec.	• OMS 53-2 • PS 8	CS 8-6 CS 8-6A CS 8-7 **CS 8-7A** CS 8-8 CS 8-9	C-Plan Map Ref. 44E Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

McCoy Creek — CS 8-7A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Confluence of McCoy Creek and Salcha River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Boat from the Salcha River

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish containment sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.
Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish containment booming operations at sites of opportunity near the containment site.

Summer Response Tactic(s):
Containment booming
Water dam at low water levels

Winter Response Tactic(s):
Ice slotting
Oil is not likely to migrate this far downstream

Additional Containment Sites Above this Location:
CS 8-9 CS 8-8

Additional Containment Sites Below this Location:
CS 8-6A

III. General Site Information

Water Path:
McCoy Creek crosses the pipeline well upstream of this site.
Site is on the confluence of McCoy Creek and the Salcha River.

Water Variations:
The creek is generally stable, but it could receive back flow from the Salcha River.

LZ Location:
At site

Forward Staging Area:
OMS 53-2

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable soils
Possible 3-4' bank or deep water at the edge

Vegetation Conditions at Site:
Heavy
Trees and brush along the stream bank

Location of Nearest Initial Helicopter Refueling Point:
Delta River

Utilize Additional Response Resources from:
PS09
Nordale Yard

Communications Resources Available:
VHF

Wildlife Sensitivities: Moose, bear, small game, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites			CS 8-8 Minton Creek
• Width = 3 ft. - 6 ft. • Velocity = 1 - 4 ft./sec.	• PS 8 • Work Pad @ PLMP 509	CS 8-6 CS 8-7A	CS 8-6A **CS 8-8**	CS 8-7 CS 8-9	C-Plan Map Ref. 45 Aerial Map Ref. 266 (b) (7)(F), (b) (3) Contact AP SC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | CS C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Minton Creek — CS 8-8

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
Pipeline crossing of Minton Creek	N/A		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- ROW access	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Establish containment at sites where oil recovery, storage and transport can be optimized.

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish containment booming operations at sites of opportunity near the containment site.

Establish recovery, storage, and transfer systems to remove oil from storage systems at the sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Water dam Booming	Water dam May not flow in this area

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
N/A	N/A

III. General Site Information

Water Path:	Water Variations:
N/A	N/A

LZ Location:	Forward Staging Area:
On ROW nearby	On ROW

Nearest Pump Station/Response Base:
PS08

Response Equipment On Site (Kits and major items):
Underflow Dam Kit

(b) (7)(F), (b) (3)

Vegetation Conditions at Site:
Trees, shrub and brush along ROW corridor and stream bank

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	PS09 Nordale

Communications Resources Available:
VHF, ARTS

Wildlife Sensitivities: Moose, bear, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-9 McCoy Creek
• Width = 5 - 15 ft. • Velocity = 1 - 3 ft./sec.	• PS 8 Response Base • CS 8-6A PLMP 495.7 • Transition @ PLMP 514.4 • OMS 53-2	CS 8-6 CS 8-6A CS 7 CS 8-7A CS 8-8 **CS 8-9**	C-Plan Map Ref. 45 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

[redacted]

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

McCoy Creek — CS 8-9

I. Site Location

Location Description:	Nearest Highway MP:	(b) (7)(F), (b) (3)	GPS Coordinates:
McCoy Creek	N/A	[redacted]	(b) (7)(F), (b) (3) [redacted],

Primary Access:	Secondary Access:
Helicopter	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish storage and transfer operations at recovery sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming Possible use of water dam at low water levels	Ice slotting Oil unlikely to migrate this far

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
N/A	CS 8-7A

III. General Site Information

Water Path:	Water Variations:
The pipeline crosses McCoy Creek upstream of the site. McCoy enters the Salcha River downstream of the site.	The creek is fairly stable but is susceptible to seasonal influences.

LZ Location:	(b) (7)(F), (b) (3)
At site	[redacted]

Nearest Pump Station/Response Base:
PS09

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable Three to six-foot drop to water in most areas	Heavy vegetation along the stream old burn area behind

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	

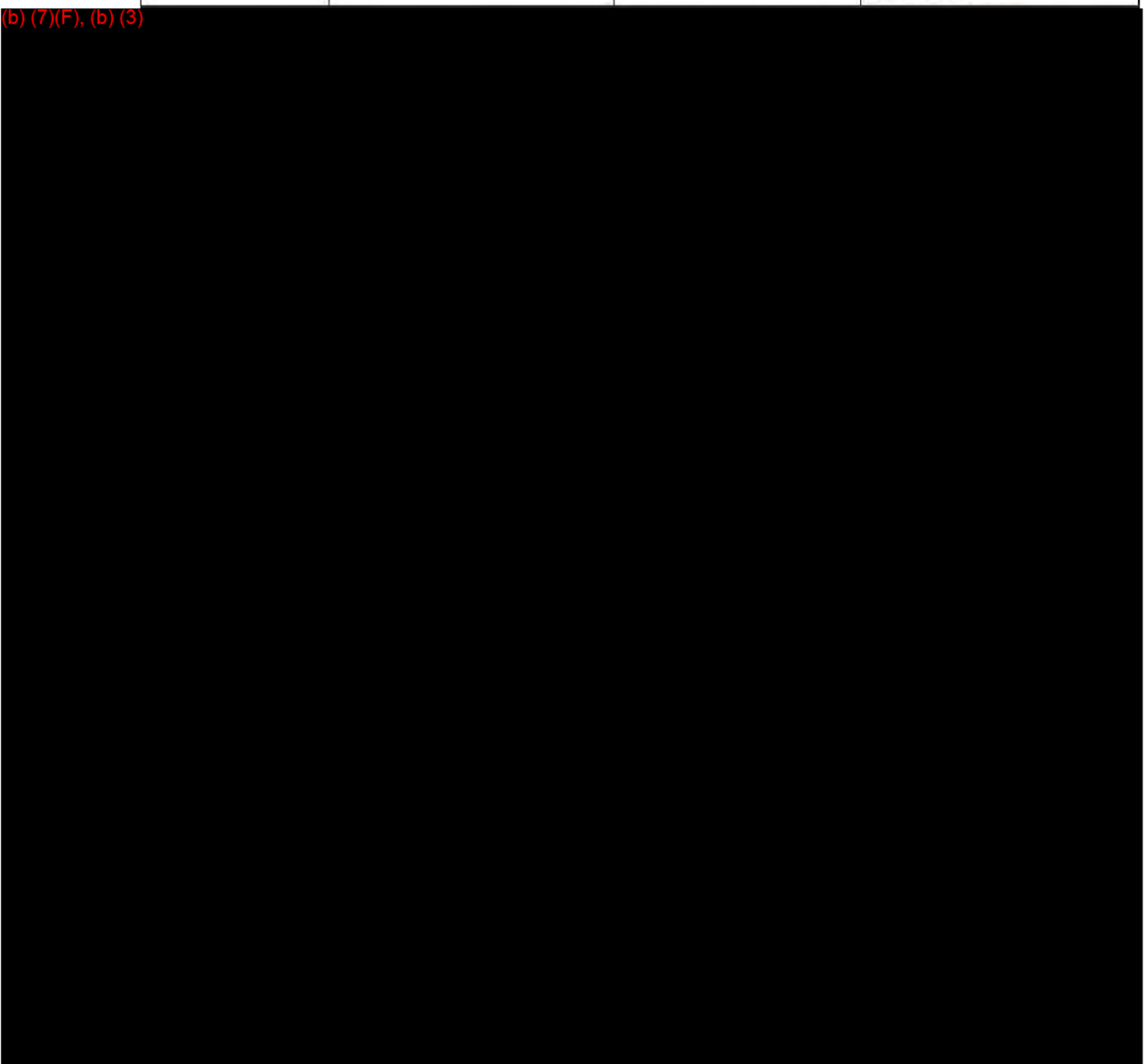
Communications Resources Available:
VHF, cell phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-12 Shaw Creek
• Width = 50 ft. - 150 ft. • Velocity = 1 - 3 ft./sec.	• On-site Boat Launch • Saw Creek Road • PS 9	CS 8-12 CS 8-13	C-Plan Map Ref. 46 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Shaw Creek — CS 8-12

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- Richardson Highway to Shaw Creek Road	Boat- Tanana River to Shaw Creek

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish storage and transfer operations at recovery sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
N/A	N/A

III. General Site Information

Water Path:	Water Variations:
Pipeline crosses Shaw Creek approximately three miles upstream of the site. The site is at the confluence of Shaw Creek and the Tanana River.	The creek is suscept ble to seasonal and rain influences as well as some influence from the Tanana River.
LZ Location:	**Forward Staging Area:**
On either side of the creek upstream of the Richardson Highway	At site- public parking area

Nearest Pump Station/Response Base:
PS08 or PS09

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Public boat launch on site Open banks with gravel	Trees in the area Site is open along the roadway
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Delta Junction	PS09 Nordale Yard

Communications Resources Available:
VHF, ARTS, CB, cell phone

Wildlife Sensitivities: Waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-13 Rosa Creek
• Width = 8 ft. - 20 ft. • Velocity = 1 - 3 ft./sec.	• OMS 50-1 • PS 8	CS 8-12 **CS 8-13**	C-Plan Map Ref. 45 Aerial Map Ref. 269 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh / Trees
Water Dam	Boat Launch	Pump Station	Tussock/Tundra
C.S. Sign	Trail/Clearing	Aboveground Pipe	Sand/Gravel
Tank	Water / LWC	Belowground Pipe	
Tote			
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Rosa Creek CS 8-13

I. Site Location

Location Description:
Rosa Creek

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive- ROW Access

Secondary Access:
Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Water dam
Possible use of small boom sets

Winter Response Tactic(s):
Water dam in open areas
Ice slotting

Additional Containment Sites Above this Location:
N/A

Additional Containment Sites Below this Location:
CS 8-12

III. General Site Information

Water Path:
Rosa Creek parallels the pipeline in this area and flows into Shaw Creek which flows into the Tanana River.

Water Variations:
The creek has minimal variations but may be susceptible to rain influences.

(b) (7)(F), (b) (3)

Forward Staging Area:
(b) (7)(F), (b) (3)

Nearest Pump Station/Response Base:
PS08 or PS09

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable
Small drop to the water

Vegetation Conditions at Site:
Heavy trees and brush

Location of Nearest Initial Helicopter Refueling Point:
Delta Junction

Utilize Additional Response Resources from:
PS09

Communications Resources Available:
VHF, ARTS, CB, cell phone

Wildlife Sensitivities: Moose, small game, bear, eagle

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-14 Delta River
• Width = 50 - 500 ft. • Velocity = 3 - 8 ft./sec.	• On Site Concrete Plant • Delta Junction • PS 9	**CS 8-14** CS 8-15 CS 8-16 CS 8-18	C-Plan Map Ref. 47, 48 Aerial Map Ref. 283 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert · Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC · Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe · Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Delta River

CS 8-14

I. Site Location

Location Description:		GPS Coordinates:
Delta Concrete Plant	(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- The site is at the back of the concrete plant	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Maximize oil storage through the use of decanting procedures.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Establish deflection and containment boom sites at areas of opportunity along the river bank.

Deploy recovery and transfer systems at associated containment sites.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming Possible use of water dams in small channels	Deflection and containment booming Possible use of water dams in small channels

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 8-18	CS 8-16

III. General Site Information

Water Path:	Water Variations:
Delta River is heavily braided and flows several miles downstream to the Tanana River.	The river is suscept ble to seasonal flooding and rain influences.

LZ Location:	Forward Staging Area:
In open areas at concrete plant	In open areas at concrete plant

Nearest Pump Station/Response Base:
PS09

Response Equipment On Site (Kits and major items):
1 Auxiliary Conex, BoomThis equipment is stored in a conex at PS09.

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Fast water Bank is generally reinforced by plant operator	N/A

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	Nordale Yard PS08

Communications Resources Available:
VHF, ARTS, CB, cell phone

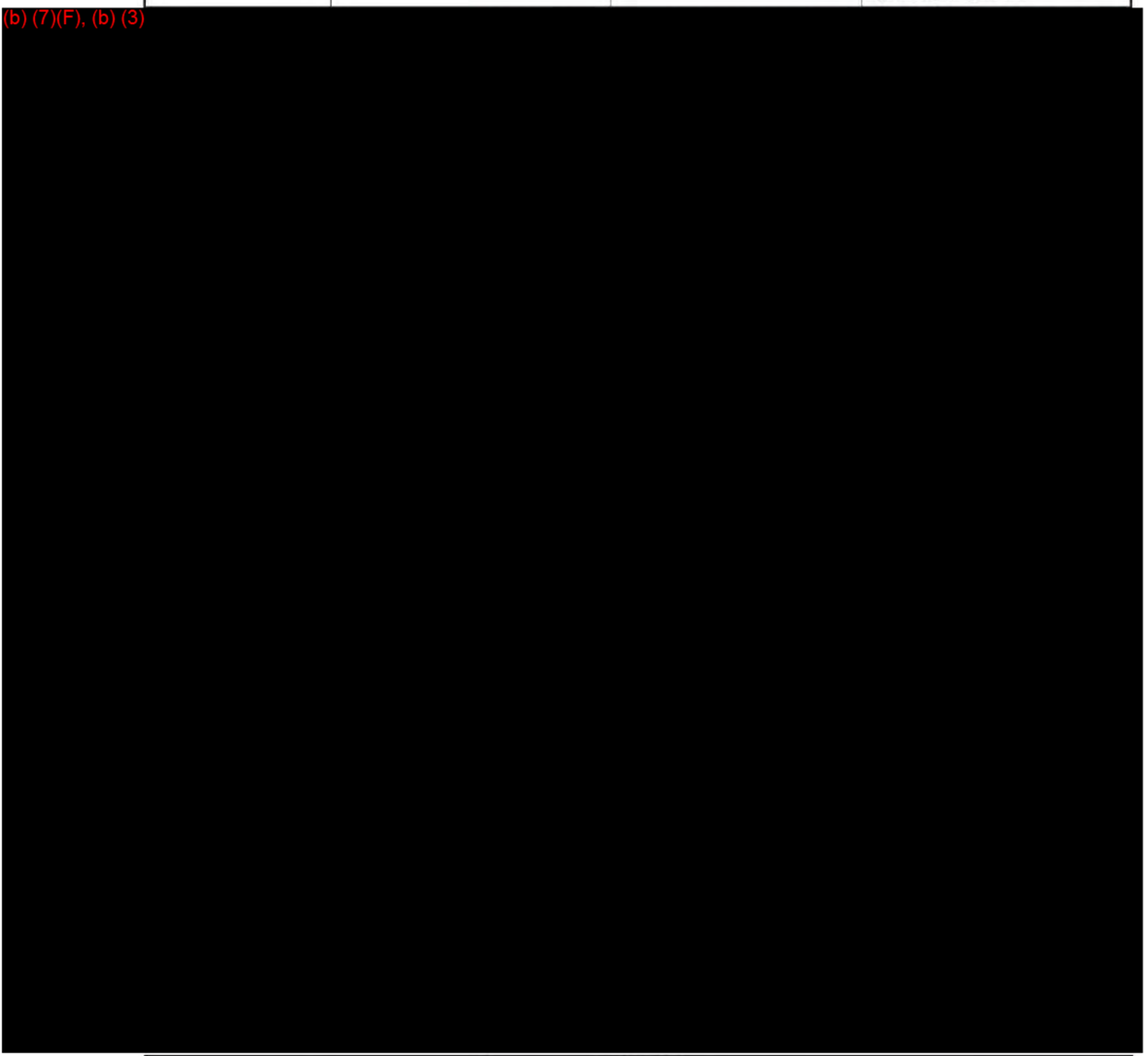
Wildlife Sensitivities: N/A

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-15 Tanana River
• Width = 50 - 150 ft. • Velocity = 1 - 4 ft./sec.	• Security Compound • PS 9	CS 8-14 **CS 8-15** CS 8-16 CS 8-18	C-Plan Map Ref. 47 Aerial Map Ref. 278, 279 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh / Trees
Water Dam	Boat Launch	Pump Station	Tussock/Tundra
C.S. Sign	Trail/Clearing	Aboveground Pipe	Sand/Gravel
Tank	Water / LWC	Belowground Pipe	
Tote			
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tanana River — CS 8-15

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3),

Primary Access:	Secondary Access:
Boat from Tanana River	Drive- access at the north security entrance to the pipeline crossing

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom sites at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming
Additional Containment Sites Above this Location:	**Additional Containment Sites Below this Location:**
N/A	CS 8-16

III. General Site Information

Water Path:	Water Variations:
The site is just above the confluence of the Tanana River and Delta River.	The river is fairly stable with some suscept bility to rain influences.
LZ Location:	**Forward Staging Area:**
At security compound behind the site	At security compound behind the site

Nearest Pump Station/Response Base:
PS09

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Steep drop three to five feet to water Stable bank	Open trail access, trees and heavy brush around the site
Location of Nearest Initial Helicopter Refueling Point:	**Utilize Additional Response Resources from:**
Delta Junction	N/A

Communications Resources Available:
VHF, ARTS, cell phone, CB

Wildlife Sensitivities: Moose, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 8-16 Tanana River
• Width = 300 - 600 ft. • Velocity = 3 - 8 ft./sec.	• PS 9 • Haines Pipeline Pump Station	CS 8-14 CS 8-15 **CS 8-16** CS 8-18	C-Plan Map Ref. 47 Aerial Map Ref. 277, 278 (b) (7)(F), (b) (3) Contact AP-SC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tanana River — CS 8-16

I. Site Location

Location Description:
Tanana River.

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive

Secondary Access:
Boat from Tanana River

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):
Deflection and containment booming

Winter Response Tactic(s):
Deflection and containment booming at areas of opportunity

Additional Containment Sites Above this Location:
CS 8-14 CS 8-15
CS 8-18

Additional Containment Sites Below this Location:
N/A

III. General Site Information

Water Path:
Tanana River flows along the pipeline and highway corridor.

Water Variations:
The river is suscept ble to seasonal and rain influences. The flow is fast and carries debris.

LZ Location:
At parking area
Old fuel transfer depot near the highway

Forward Staging Area:
At old fuel transfer depot near sign

Nearest Pump Station/Response Base:
PS09

Response Equipment On Site (Kits and major items):
Enhanced Standard Conex, Auxiliary Conex, Boom

Stream Bank Conditions at Site:
Steep banks, fast water

Vegetation Conditions at Site:
Open trails, trees, vegetation to bank edge

Location of Nearest Initial Helicopter Refueling Point:
Delta Junction

Utilize Additional Response Resources from:
Nordale Yard
PS08

Communications Resources Available:
VHF, cell phone, ARTS, CB

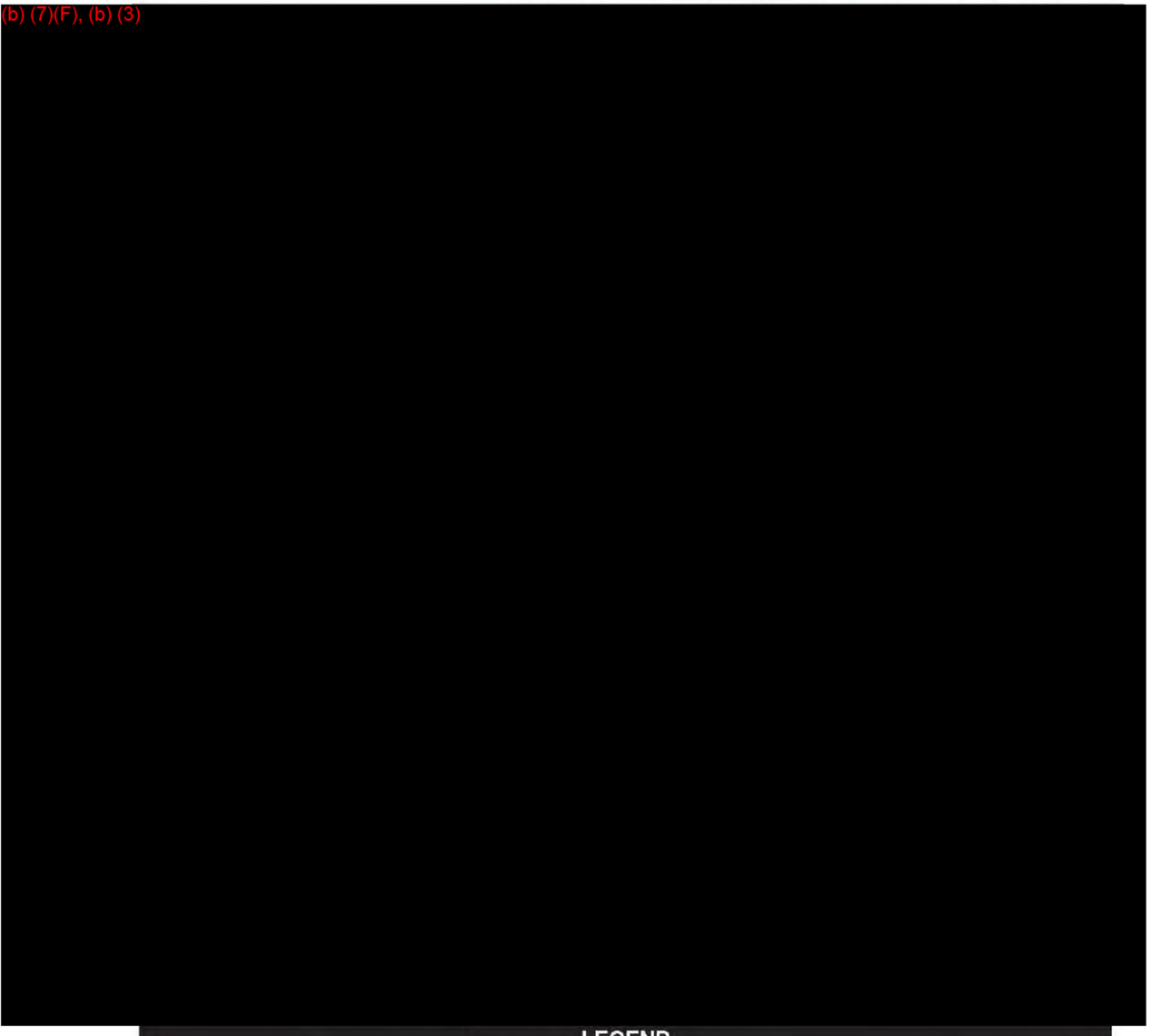
Wildlife Sensitivities: Waterfowl

IV. General Site Description

Fast water conditions are present at all times.

The banks are steep, and the river has numerous eddies.

River Data	Staging Areas	Base Map Containment Sites	CS 8-18 Jarvis Creek
• Width = Braided channels 50 - 250 ft. • Velocity = 2 - 10 ft./sec.	• Gravel pad west of bridge • 45 APL-4 • PS 9	CS 8-14 CS 8-15 CS 8-16 **CS 8-18**	C-Plan Map Ref. 48 Aerial Map Ref. 285 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North



Not to Scale

Alyeska pipeline SERVICE COMPANY

Jarvis Creek CS 8-18

I. Site Location

Location Description:	(b) (7)(F), (b) (3)	GPS Coordinates:
Richardson Highway crossing of Jarvis Creek.		(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- access from the highway	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom sites at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
N/A	CS 8-14 CS 8-16

III. General Site Information

Water Path:	Water Variations:
Jarvis Creek crosses the pipeline upstream of the site and enters the Tanana River 0.1 mile below.	The creek is suscept ble to seasonal and rain influences.

LZ Location:	Forward Staging Area:
Multiple sites and gravel bars Primary is Southwest of the road crossing	Large gravel areas nearby

Nearest Pump Station/Response Base:
PS09

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel, very gradual and flat in the area	Open area

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Delta Junction	Nordale Yard GRB

Communications Resources Available:
VHF, ARTS, cell phone, CB

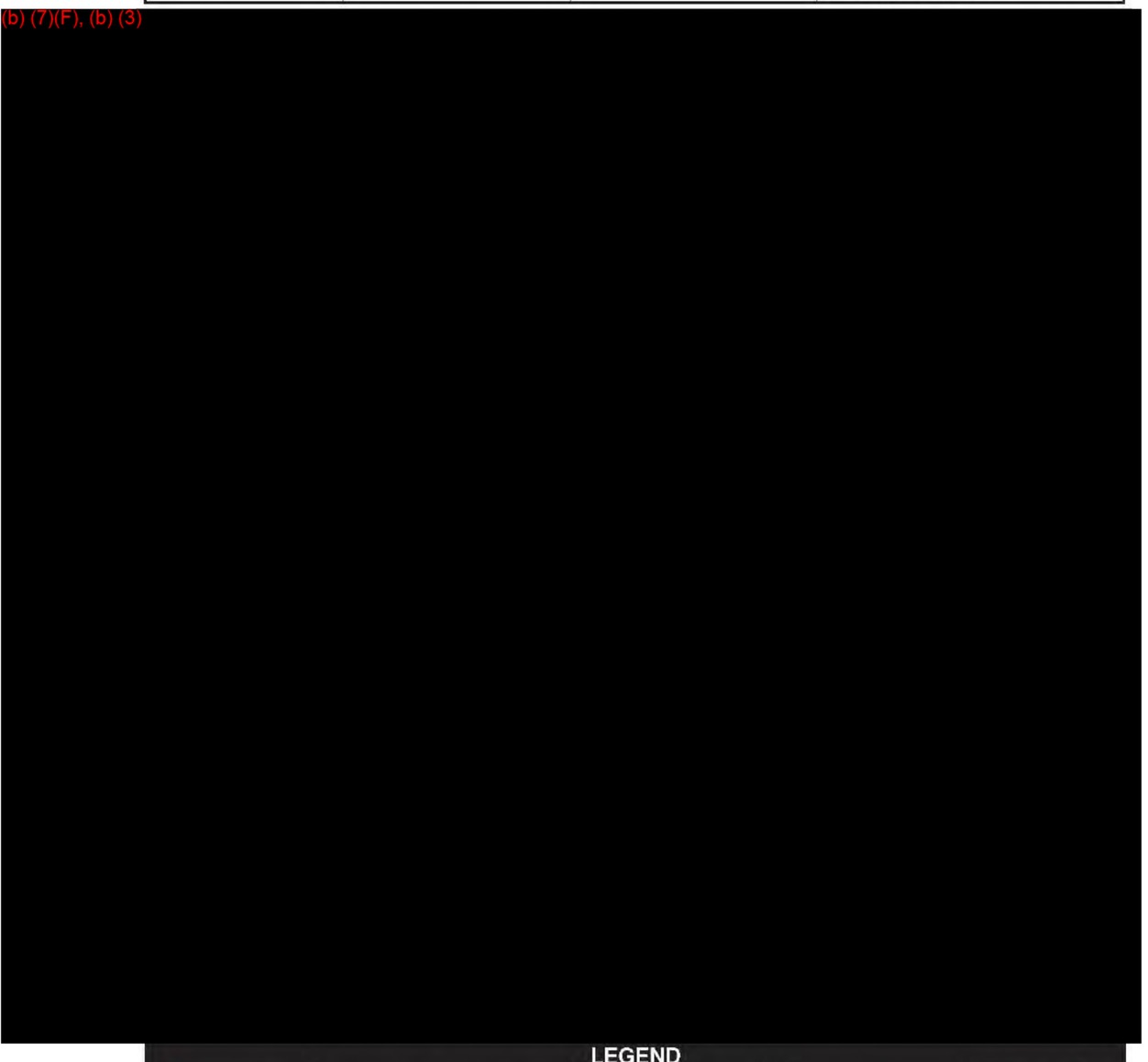
Wildlife Sensitivities: Waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 10-1 Delta River
• Width = 100 - 350 ft. Braided Channels • Velocity = 2 - 6 ft./sec.	• 37 APL-2 • PS 10	**CS 10-1** CS 10-2 CS 10-3 CS 10-4 CS 10-5	C-Plan Map Ref: 53 Aerial Map Ref: 306 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Delta River

CS 10-1

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Delta River	(b) (7)(F), (b) (3)
Primary Access: Helicopter	**Secondary Access:** Boat via the Delta River

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize to boom vanes to divert oil to containment and recovery sites.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming

Additional Containment Sites Above this Location:		Additional Containment Sites Below this Location:
CS 10-2	CS 10-4	N/A
CS 10-3	CS 10-5	

III. General Site Information

Water Path:	Water Variations:
Delta River flows alongside the pipeline.	The river is suscept ble to seasonal and rain influences.
LZ Location: At scene	**Forward Staging Area:** 37 APL-2

Nearest Pump Station/Response Base:
PS10

Response Equipment On Site (Kits and major items):
N/A

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel bank with a drop off Numerous gravel bars at normal water levels.	Trees and brush along the bank
Location of Nearest Initial Helicopter Refueling Point: Gulkana	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, ARTS

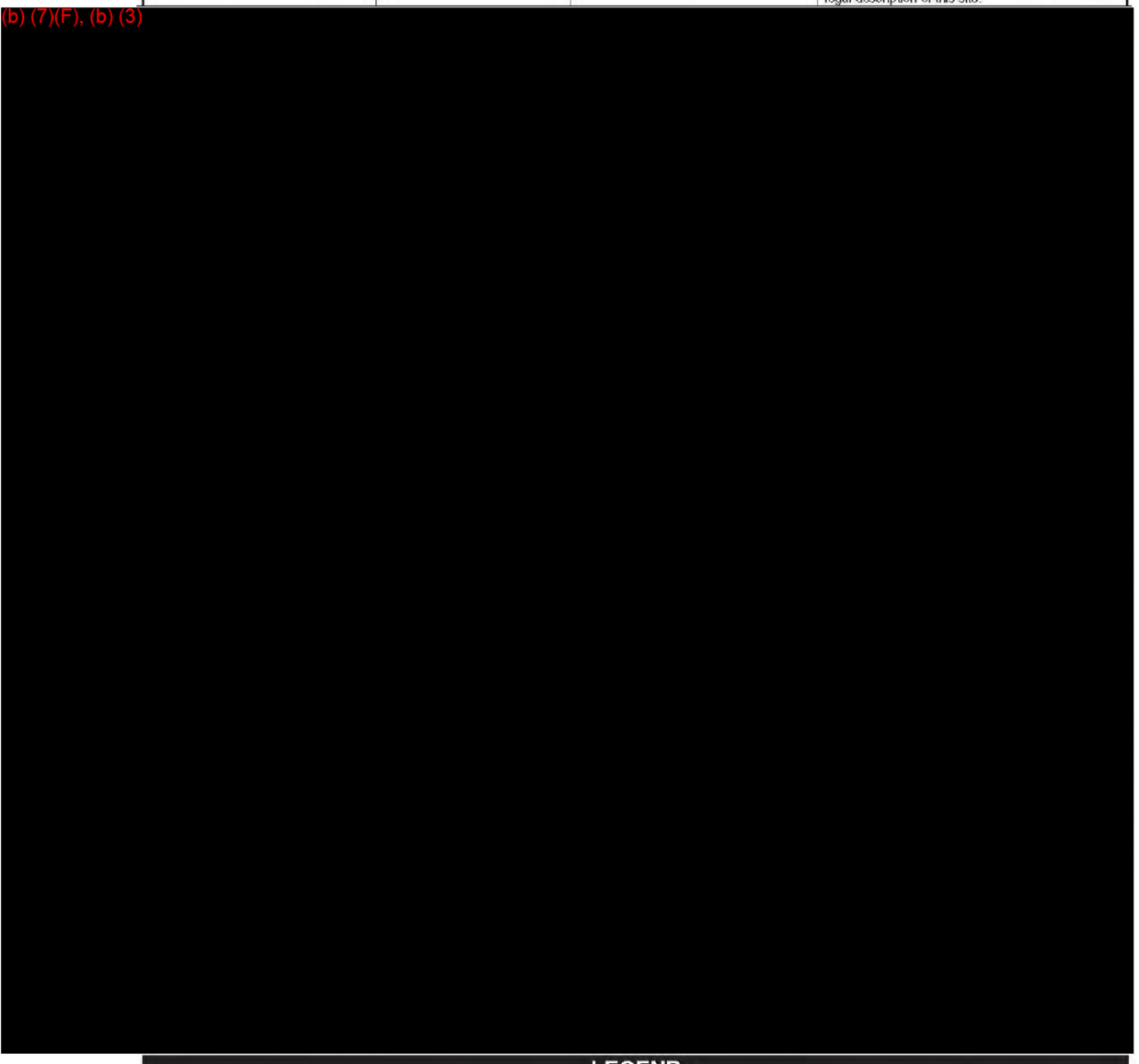
Wildlife Sensitivities: Moose, bear, waterfowl

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 10-2 Phelan Creek
• Width = 50 - 200 ft. Multiple Braided Channels • Velocity = 2 - 6 ft./sec.	• 36A APL-1 • PS 10	CS 10-1 **CS 10-2** CS 10-3 CS 10-4 CS 10-5	C-Plan Map Ref. 53 Aerial Map Ref. 307 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | CS C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Phelan Creek CS 10-2

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Phelan Creek	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive	Helicopter to 36A APL-1

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom sites at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Booming Possible use of water dams in small channels	Booming Water dam at areas of opportunity

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 10-3 CS 10-4 CS 10-5	CS 10-1

III. General Site Information

Water Path:	Water Variations:
Phelan Creek enters the Delta River below this site.	The creek is suscept ble to seasonal and rain influences.
LZ Location: 36A APL-1	**Forward Staging Area:** 36A APL-1

Nearest Pump Station/Response Base:
PS10

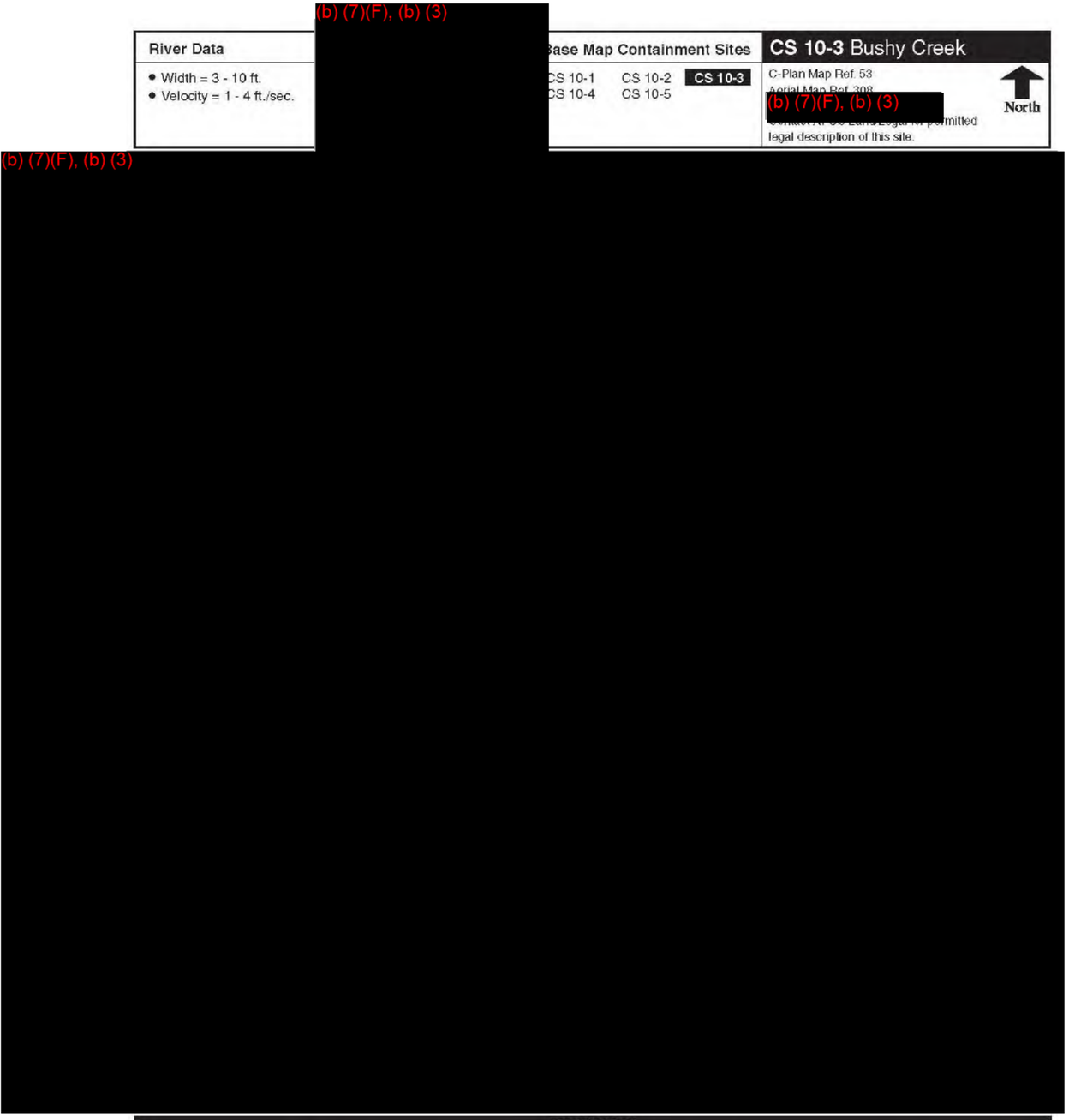
Response Equipment On Site (Kits and major items):
N/A

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Open access to gravel bars	Minimal
Location of Nearest Initial Helicopter Refueling Point: Gulkana	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, ARTS, CB

Wildlife Sensitivities: N/A

IV. General Site Description



Alyeska pipeline SERVICE COMPANY

Bushy Creek CS 10-3

I. Site Location

Location Description: Bushy Creek near confluence w/ Phelan Creek	**GPS Coordinates:** (b) (7)(F), (b) (3)
Primary Access: Helicopter	**Secondary Access:** N/A

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s): Water dam	**Winter Response Tactic(s):** Water dam- may not flow year round
Additional Containment Sites Above this Location: N/A	**Additional Containment Sites Below this Location:** CS 10-1 CS 10-2

III. General Site Information

Water Path: Bushy Creek flows along the pipeline into Phelan Creek near confluence with the Delta River.	**Water Variations:** The creek is suscept ble to seasonal and rain influences.
LZ Location: At site.	**Forward Staging Area:** 36 APL-1

Nearest Pump Station/Response Base: PS10

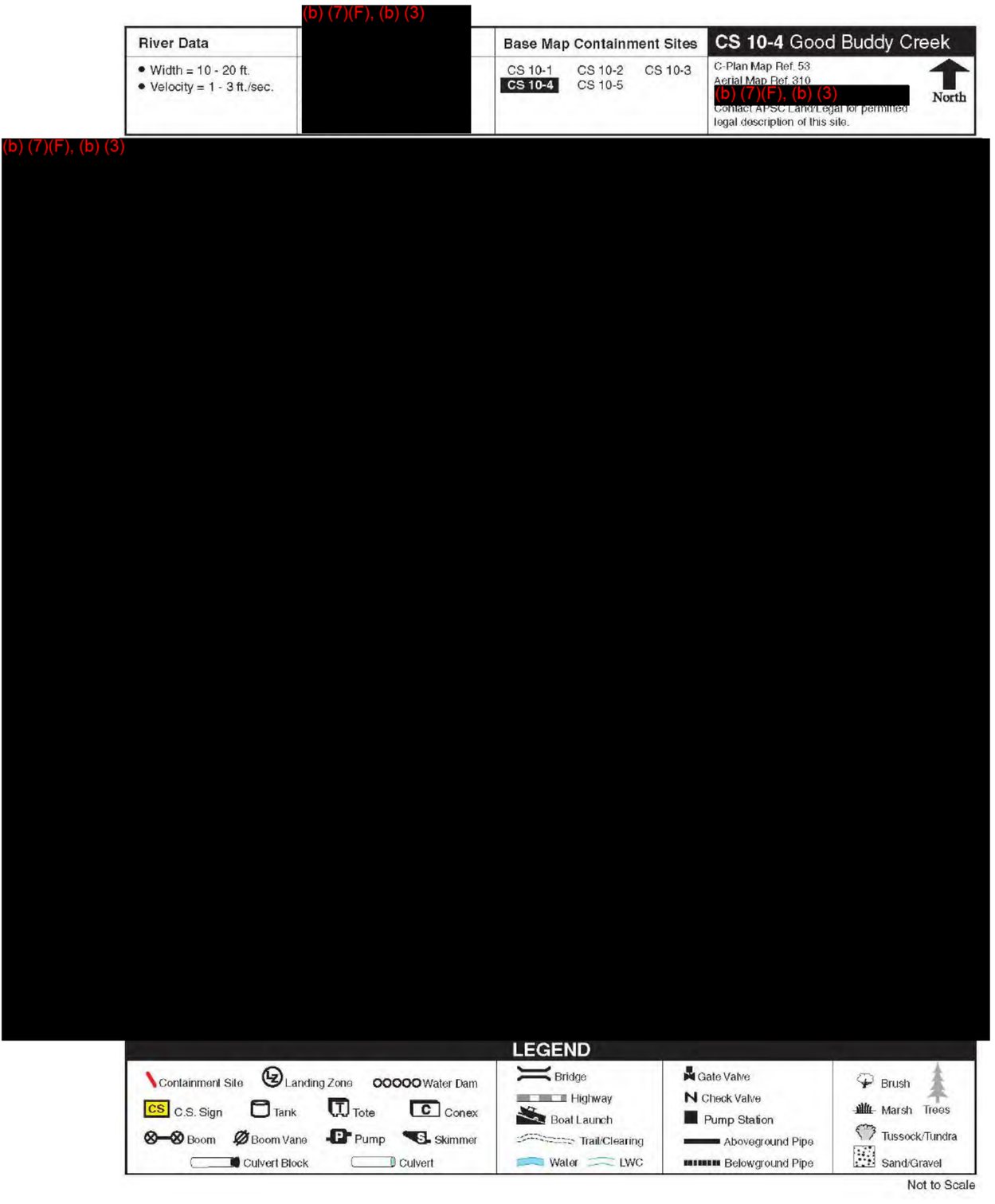
Response Equipment On Site (Kits and major items): N/A

Stream Bank Conditions at Site: Solid ground, gravel bank gentle slope to gravel stream.	**Vegetation Conditions at Site:** Heavy brush around the site and along the stream bank
Location of Nearest Initial Helicopter Refueling Point: Gulkana	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available: UHF, ARTS, CB

Wildlife Sensitivities: Bear, small game, eagle

IV. General Site Description



Not to Scale

Alyeska pipeline SERVICE COMPANY

Good Buddy Creek — CS 10-4

I. Site Location

Location Description:
Confluence of Good Buddy Creek with Phelan Creek (b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
N/A

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish storage and transfer operations at recovery sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):
Water Dam

Winter Response Tactic(s):
Water Dam

Additional Containment Sites Above this Location:
N/A

Additional Containment Sites Below this Location:
CS 10-2
CS 10-1

III. General Site Information

Water Path:
Good Buddy Creek flows from the pipeline crossing into Phelan Creek.

Water Variations:
The creek is suscept ble to seasonal and rain influences.

LZ Location:
At site

Forward Staging Area:
OMS 37-OR

Nearest Pump Station/Response Base:
PS10

Response Equipment On Site (Kits and major items):
Three totes of underflow dam equipment

Stream Bank Conditions at Site:
Gradual, gravel slope

Vegetation Conditions at Site:
Thick brush along bank generally open with small trees

Location of Nearest Initial Helicopter Refueling Point:
Gulkana

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
UHF, ARTS, CB

Wildlife Sensitivities: N/A

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 10-5 Wonder Creek
• Width = 0 - 3 ft. • Velocity = 0 - 4 ft./sec.	• 36A APL-1A • PS 10	CS 10-1 CS 10-2 CS 10-3 CS 10-4 **CS 10-5**	C-Plan Map Ref. 54 Aerial Map Ref. 310 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (2) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; T Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; N Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Wonder Creek CS 10-5

I. Site Location

Location Description:	(b) (7)(F), (b) (3) [redacted]	GPS Coordinates:
On dry creek above Phelan Creek		(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondary Access:
Helicopter	Drive at 36APL-1A

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.

Deploy water dam system to develop recovery areas for skimmer systems.

Establish storage and transfer operations at recovery sites.

Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):	Winter Response Tactic(s):
Additional areas to deploy water dam or small dyke.	Does not appear to flow during most of the year.

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
N/A	CS 10-5

III. General Site Information

Water Path:	Water Variations:
The creek is seasonally dry and drains downhill to Phelan Creek.	The creek is suscept ble to seasonal and rain influences, but , otherwise it does not flow.

LZ Location:	Forward Staging Area:
36 APL- 1A	36 APL- 1A

Nearest Pump Station/Response Base:
PS10

Response Equipment On Site (Kits and major items):
Underflow Dam Kit

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Steep hill, very narrow stream	Light brush There are trees away from the site

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Gulkana Airport	PS11 Response Base

Communications Resources Available:
VHF, ARTS, CB

Wildlife Sensitivities: Small game

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 10-6 Paxon Lake
• Width = 100 ft. - 200 ft. • Velocity = 0 - 1 ft./sec.	• OMS 30-22 • PS 10	CS 10-6 CS 10-10 CS 10-11 CS 10-12 CS 10-17	C-Plan Map Ref. 57, 57W Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site; Landing Zone; Water Dam	Bridge	Gate Valve	Brush; Trees
CS C.S. Sign; Tank; Tote; C Conex	Highway	N Check Valve	Marsh
Boom; Boom Vane; P Pump; S Skimmer	Boat Launch	Pump Station	Tussock/Tundra
Culvert Block; Culvert	Trail/Clearing	Aboveground Pipe	Sand/Gravel
	Water; LWC	Belowground Pipe	

Not to Scale

Alyeska pipeline SERVICE COMPANY

Paxson Lake CS 10-6

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Outlet of Paxson Lake

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Boat from Paxson Lake

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):
Deflection booming
Containment booming

Winter Response Tactic(s):
Ice slotting not likely to be activated due to distance from source

Additional Containment Sites Above this Location:
CS 10-7 CS 10-8
CS 10-7A CS 10-9
CS 10-9A

Additional Containment Sites Below this Location:
None in the immediate area.

III. General Site Information

Water Path:
Paxson Lake outlet

Water Variations:
Minimal- lake influence

LZ Location:
At site.

Forward Staging Area:
OMS 30-2R

Nearest Pump Station/Response Base:
PS10

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Shallow bank with a steep drop off

Vegetation Conditions at Site:
Open walking with moderate brush in the area

Location of Nearest Initial Helicopter Refueling Point:
Gulkana

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, ARTS, CB

Wildlife Sensitivities: Waterfowl, bear, small game

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 10-7 Gulkana River
• Width = 100 ft. - 200 ft. • Velocity = 1 - 3 ft./sec.	• OMS 32-0.0 • PS 10 • Paxon Lake public areas	CS 10-7 CS 10-7A CS 10-8 CS 10-9 CS 10-9A	C-Plan Map Ref. 56 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | CS C.S. Sign | Tank | T Tote | C Conex | Boom | Boom Vane | P Pump | S Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | N Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gulkana River CS 10-7

I. Site Location

Location Description:
Entrance of Gulkana River to Paxson Lake

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Boat from Paxson Lake

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Maximize oil storage through the use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom sites at areas of opportunity along the river bank.
Establish recovery, storage, transfer systems and procedures at containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):
Deflection booming
Containment boom

Winter Response Tactic(s):
Ice slotting
Booming in open area upstream of confluence

Additional Containment Sites Above this Location:
CS 10-7A
CS 10-8
CS 10-9
CS 10-9A

Additional Containment Sites Below this Location:
CS 10-6 is site's lake entrance; outlet is well out of the region.

III. General Site Information

Water Path:
Gulkana River enters Paxson Lake at this site.

Water Variations:
Minimal lake influence

LZ Location:
At site

Forward Staging Area:
OMS 32.0

Nearest Pump Station/Response Base:
N/A

Response Equipment On Site (Kits and major items):
N/A

Stream Bank Conditions at Site:
Site is on shallow bank above the river.
Steep edge to the bank

Vegetation Conditions at Site:
Open walking with some trees in the area

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
UHF, ARTS, CB

Wildlife Sensitivities: Waterfowl, small game

IV. General Site Description

River Data	Staging Areas	Base Map Containment Sites	CS 10-7A Gulkana River
• Width = 50 ft. - 200 ft. • Velocity = 1 - 3 ft./sec.	• Nearby landing strip • PS 10 • Public facilities in the area	CS 10-7 **CS 10-7A** CS 10-8 CS 10-9 CS 10-9A	C-Plan Map Ref. 55 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gulkana River

CS 10-7A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Gulkana River

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter.

Secondary Access:
Boat from Paxson or Summit Lake.

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Deflection booming

Winter Response Tactic(s):
Ice slotting

Additional Containment Sites Above this Location:
CS 10-8

Additional Containment Sites Below this Location:
CS 10-7

III. General Site Information

Water Path:
Gulkana River meanders through this general area.

Water Variations:
The area is susceptible to lake influences.

LZ Location:
At site on the west side of the river

Forward Staging Area:
Landing strip nearby

Nearest Pump Station/Response Base:
PS10

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Gradual and stable
Some cut bank in the area

Vegetation Conditions at Site:
Open at the site but heavy trees are around the area

Location of Nearest Initial Helicopter Refueling Point:
Gulkana River

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: waterfowl, eagle

IV. General Site Description

This site is part of a braided area in the river.

There are several opportunities to deflect oil to other containment areas.

River Data	Staging Areas	Base Map Containment Sites	CS 10-8 Fish Creek
• Width = 10 ft. - 200 ft. • Velocity = 1 - 3 ft./sec.	• 33 APL-4 • Paxon • PS 10	CS 10-7 CS 10-7A **CS 10-8** CS 10-9 CS 10-9A	C-Plan Map Ref. 55 Aerial Map Ref. 317 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Fish Creek CS 10-8

I. Site Location

Location Description:
Entrance of Fish Creek into Summit Lake

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Drive – Site is off the highway but some walking may be needed

Secondary Access:
Helicopter – LZ at parking area off highway

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy recovery and transfer systems at associated containment sites
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Containment booming

Winter Response Tactic(s):
Containment booming in open areas
Ice slotting

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 10-7A is several miles downstream

III. General Site Information

Water Path:
Fish Creek crosses under the pipeline above this site. The containment site is located near the mouth of the creek where it enters the lake.

Water Variations:
The creek is suscept ble to lake influences and strong currents at high water levels.

LZ Location:
In parking area nearby or sites of opportunity up and downstream

Forward Staging Area:
Parking area just N of the site and across the highway from 33 APL:-4

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Gradual gravel banks and slope at normal water levels
There may be some cut or steep bank at high water levels.

Vegetation Conditions at Site:
Some brush, generally open wa king area along bank
May not be able to drive down to site in summer

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, ARTS

Wildlife Sensitivities: waterfowl, eagle, moose, bear

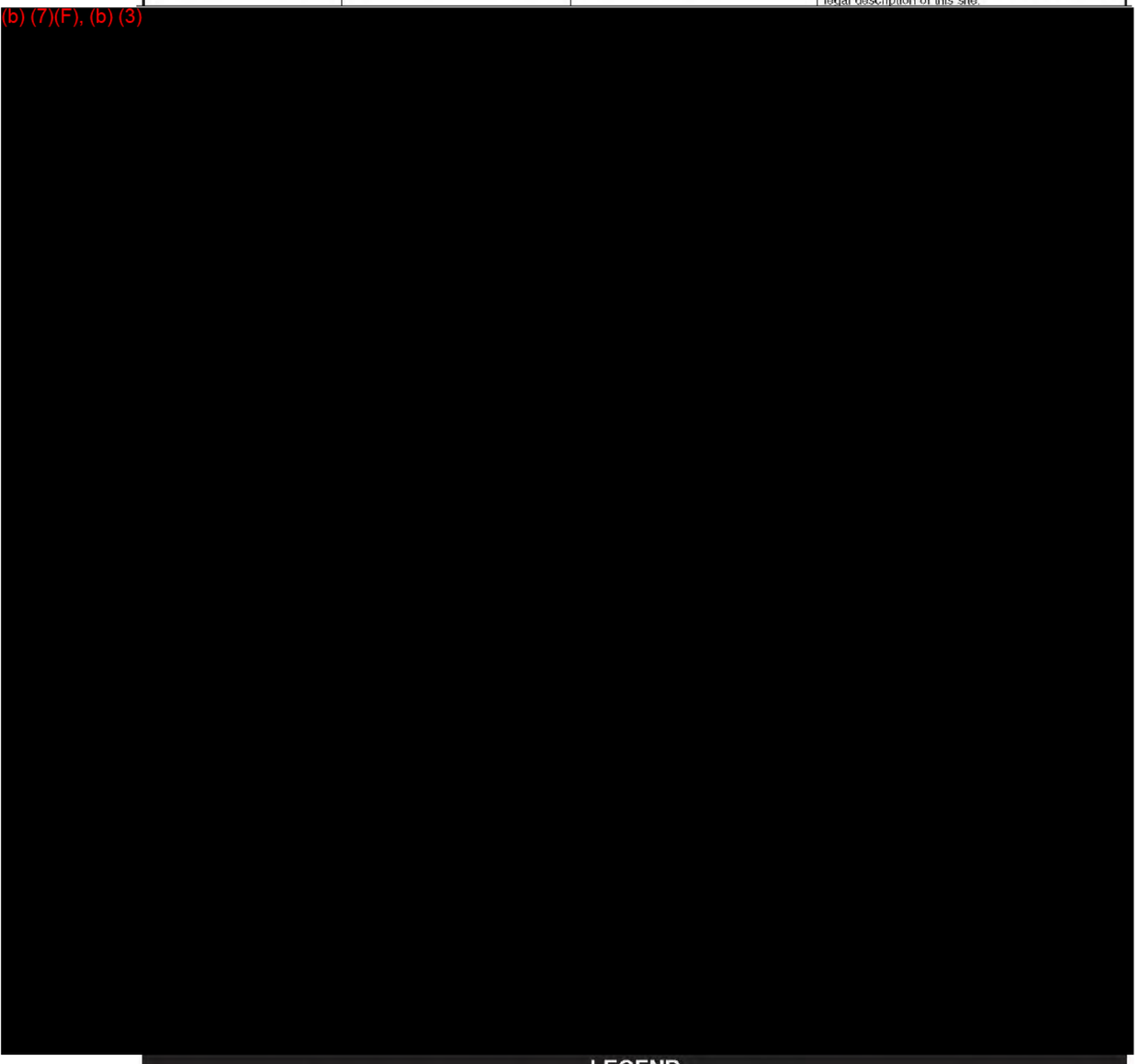
IV. General Site Description

Site is on the bank of the creek near an old highway bend. There are numerous areas upstream where the highway runs alongside the creek. The creek widens downstream from the site as it enters the lake and will require large lengths of boom.

River Data	Staging Areas	Base Map Containment Sites	CS 10-9 Gunn Creek
• Width = 10 ft. - 100 ft. • Velocity = 1 - 3 ft./sec.	• Summit Lake Landing Strip • 34 APL-1A	CS 10-7 CS 10-7A CS 10-8 **CS 10-9** CS 10-9A	C-Plan Map Ref. 54 Aerial Map Ref. 315 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gunn Creek — CS 10-9

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Just upstream of the confluence with Summit Lake

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter to LZ

Secondary Access:
Boat Summit Lake down to creek confluence

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the creek bank.
Establish recovery, storage and transfer systems at containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Diversion and containment booming
Water dam at low water levels or in small channels

Winter Response Tactic(s):
Containment boom
Ice slotting

Additional Containment Sites Above this Location:
CS 10-9A is just upstream

Additional Containment Sites Below this Location:
None before the entrance to Summit Lake

III. General Site Information

Water Path:
Gunn Creek crosses over the pipeline above this site. The creek flows under the highway and into Summit Lake through a braided set of channels just below this site.

Water Variations:
The creek is suscept ble to seasonal and rain influence at the upper end of the site but is lake influenced downstream.

LZ Location:
At site
Terrain is open enough to allow for LZs at areas of opportunity nearby

Forward Staging Area:
34 APL-1A

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat open banks with gradual slope to water at normal water levels .
High water may create steep or cut banks in certain areas.

Vegetation Conditions at Site:
Brush, generally open walking
No trees in the immediate area

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Moose, bear, waterfowl, eagle

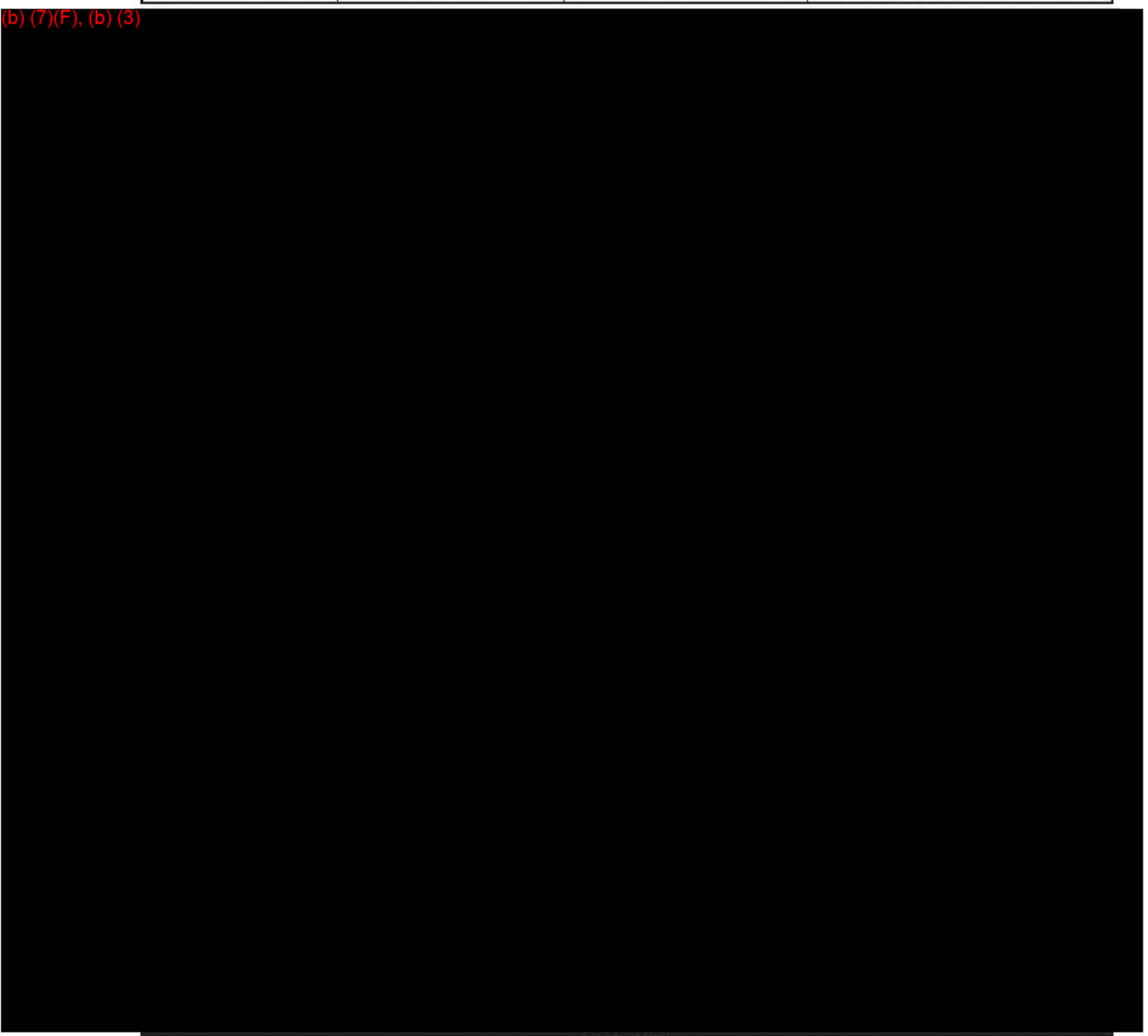
IV. General Site Description

The site is at the confluence of Gunn Creek and Summit Lake. Depending on water levels, the creek may have several gravel bars in the area.

Both banks are accessible to helicopter and wa king and have minimal brush.

River Data	Staging Areas	Base Map Containment Sites	CS 10-9A Gunn Creek
• Width = 10 ft. - 150 ft. Braided Channels • Velocity = 2 - 5 ft./sec.	• On-site landing strip at Summit Lake	CS 10-7 CS 10-7A CS 10-9 **CS 10-9A**	C-Plan Map Ref. 54 Aerial Map Ref. 214, 215 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gunn Creek — CS 10-9A

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Just upstream of the confluence with Summit Lake

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
(b) (7)(F), (b) (3)

Secondary Access:
Helicopter - LZ at parking area off highway

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the creek bank.
Establish recovery, storage and transfer systems at containment sites.
Deploy water dam system to develop recovery areas.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Diversion and containment booming
Water dam at low water levels or in small channels

Winter Response Tactic(s):
Containment boom
Ice slotting

Additional Containment Sites Above this Location:

Additional Containment Sites Below this Location:
CS 10-9

III. General Site Information

Water Path:
Gunn Creek crosses over the pipeline above this site. Below this site the creek flows under the highway and into Summit Lake through a braided set of channels.

Water Variations:
The creek is suscept ble to seasonal and rain influence at the upper end of the site but is lake influenced downstream.

LZ Location:
At site
Terrain is open enough to allow for LZs at areas of opportunity nearby

Forward Staging Area:
34 APL-1A

Nearest Pump Station/Response Base:
Glennallen Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Flat open banks with gradual slope to water at normal water levels
High water may create steep or cut banks in certain areas

Vegetation Conditions at Site:
Brush, generally open walking
No trees in the immediate area

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
Glennallen Response Base

Communications Resources Available:
VHF, satellite phone

Wildlife Sensitivities: Moose, bear, waterfowl, eagle

IV. General Site Description

The site is just upstream of the confluence of Gunn Creek and Summit Lake, and depending on water levels, the creek may have several gravel bars in the area.

Both banks are accessible to helicopter and wa king with minimal brush.

River Data	Staging Areas	Base Map C. S. Sites	CS 10-10 Spring Creek
• Width = 10 - 30 ft. • Velocity = 1 - 3 ft./sec.	• Work Pad near PLMP 635 • 30 APL-1	CS 10-6 **CS 10-10** CS 10-11 CS 10-12 CS 10-17	C-Plan Map Ref. 57 Aerial Map Ref. 327 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Spring Creek CS 10-10

I. Site Location

(b) (7)(F), (b) (3)

Location Description:
Spring Creek

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Helicopter

Secondary Access:
Helicopter – possible walk in

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Containment booming and water dams at areas of opportunity in the area

Winter Response Tactic(s):
Water dam in open areas
Snow berming and ice slotting

Additional Containment Sites Above this Location:
CS 10-11

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Spring Creek flows under the pipeline above this site and flows away from the pipeline corridor.

Water Variations:
The creek generally stays within the banks in this area with numerous meanders and bends in the channel.

LZ Location:
At site on West side of creek

Forward Staging Area:
Near RGV 96

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Stable banks, some cut bank at bends and high water areas
Two to five feet to water level in normal conditions

Vegetation Conditions at Site:
Some brush with sparse trees in the area
Access up and downstream is open

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, ARTS

Wildlife Sensitivities: Moose, eagle, waterfowl, bear

IV. General Site Description

Additional areas of opportunity are located nearby.

An oxbow is located just downstream of the site.

River Data	Staging Areas	Base Map Containment Sites	CS 10-11 Meiers Lake
• Width = 20 - 100 ft. • Velocity = 0 - 2 ft./sec.	• 30 APL-1 • Richardson Hwy. Pullout	CS 10-6 CS 10-10 **CS 10-11** CS 10-12 CS 10-17	C-Plan Map Ref. 57 Aerial Map Ref. 330 (b) (7)(F), (b) (3) [redacted] Contact AFSC Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam	Bridge	Gate Valve	Brush; Trees
CS C.S. Sign; Tank; Tote; Conex	Highway	Check Valve	Marsh
Boom; Boom Vane; Pump; Skimmer	Boat Launch	Pump Station	Tussock/Tundra
Culvert Block; Culvert	Trail/Clearing	Aboveground Pipe	Sand/Gravel
	Water; LWC	Belowground Pipe	

Not to Scale

Alyeska pipeline SERVICE COMPANY

Meiers Lake — CS 10-11

I. Site Location

Location Description:
Island near the entrance to the lake

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

Primary Access:
Helicopter

Secondary Access:
Boat from Meiers Lake launch facilities to the south

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Establish recovery, storage, transfer systems and procedures at containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Containment booming
Possible use of water dams well upstream at low water levels

Winter Response Tactic(s):
Containment boom in open areas
Ice slotting

Additional Containment Sites Above this Location:
CS 10-6

Additional Containment Sites Below this Location:
CS 10-10

III. General Site Information

Water Path:
Meiers Lake receives water from drainages crossing the pipeline upstream. The lake exit forms Meiers Creek which flows under the pipeline downstream of this site and into Spring Creek.

Water Variations:
The area is susceptible to lake influence. There is some current in the narrower channel where the island splits the creek near Meiers Lake.

LZ Location:
On the island or east side of the bank near the roadway

Forward Staging Area:
30 APL-1

Nearest Pump Station/Response Base:
PS11

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Bank is steep on island at high water level.
Normal to low water allows for access to gravel slope and gradual bank

Vegetation Conditions at Site:
Light brush on island
Moderate trees along the island and banks

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, ARTS

Wildlife Sensitivities: waterfowl. eagle

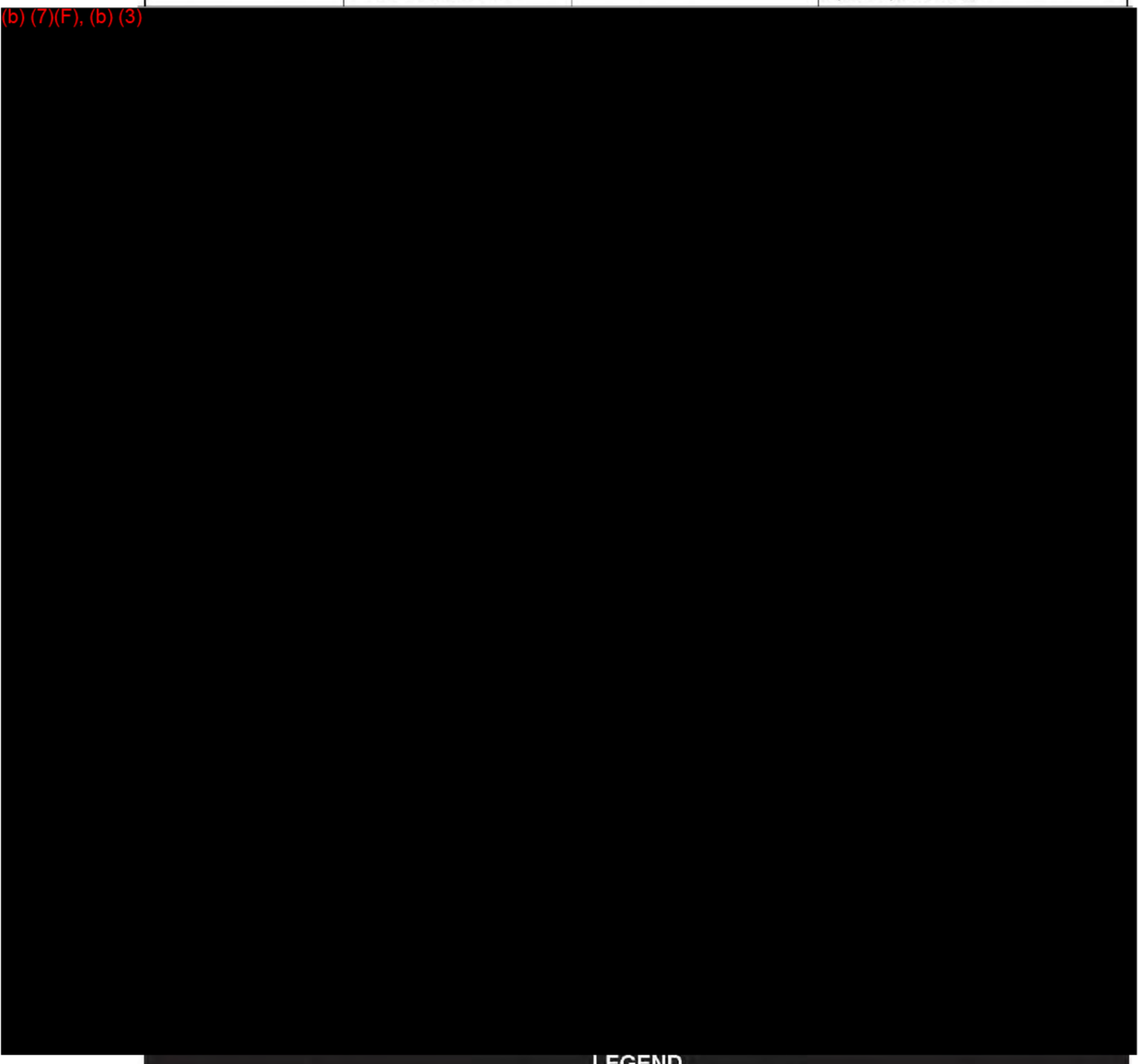
IV. General Site Description

Actual site is on an island at the confluence of the creek and lake. Numerous areas of opportunity exist upstream on both banks. Island could serve as transfer site for oil recovered on the west bank.

Parking and highway access are located above the site on both ends of the area.

River Data	Staging Areas	Base Map Containment Sites	CS 10-12 Haggard Creek
• Width = 3 ft. - 15 ft. • Velocity = 1 - 3 ft./sec.	• 28 APL-1C • OMS 28-1R • PS 10 • PS 11 Response Base	CS 10-6 CS 10-10 CS 10-11 **CS 10-12** CS 10-17	C-Plan Map Ref. 58 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert | Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC | Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe | Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Haggard Creek CS 10-12

I. Site Location

(b) (7)(F), (b) (3)

Location Description:	GPS Coordinates:
Pipeline crossing of Haggard Creek	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Drive- ROW access ble	Helicopter

II. Staging Area Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Water dam	Ice slotting Water dam

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Haggard Creek flows under the pipeline at this site and continues for several miles downstream.	The creek is suscept ble to rain influence.

LZ Location:	Forward Staging Area:
Near ROW	On ROW

Nearest Pump Station/Response Base:
PS10

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stable One to three feet to water level at normal levels	Heavy brush except for the trail

Location of Nearest Initial Helicopter Refueling Point:	Utilize Additional Response Resources from:
Gulkana Airport	PS11 Response Base.

Communications Resources Available:
VHF, ARTS, satellite phone

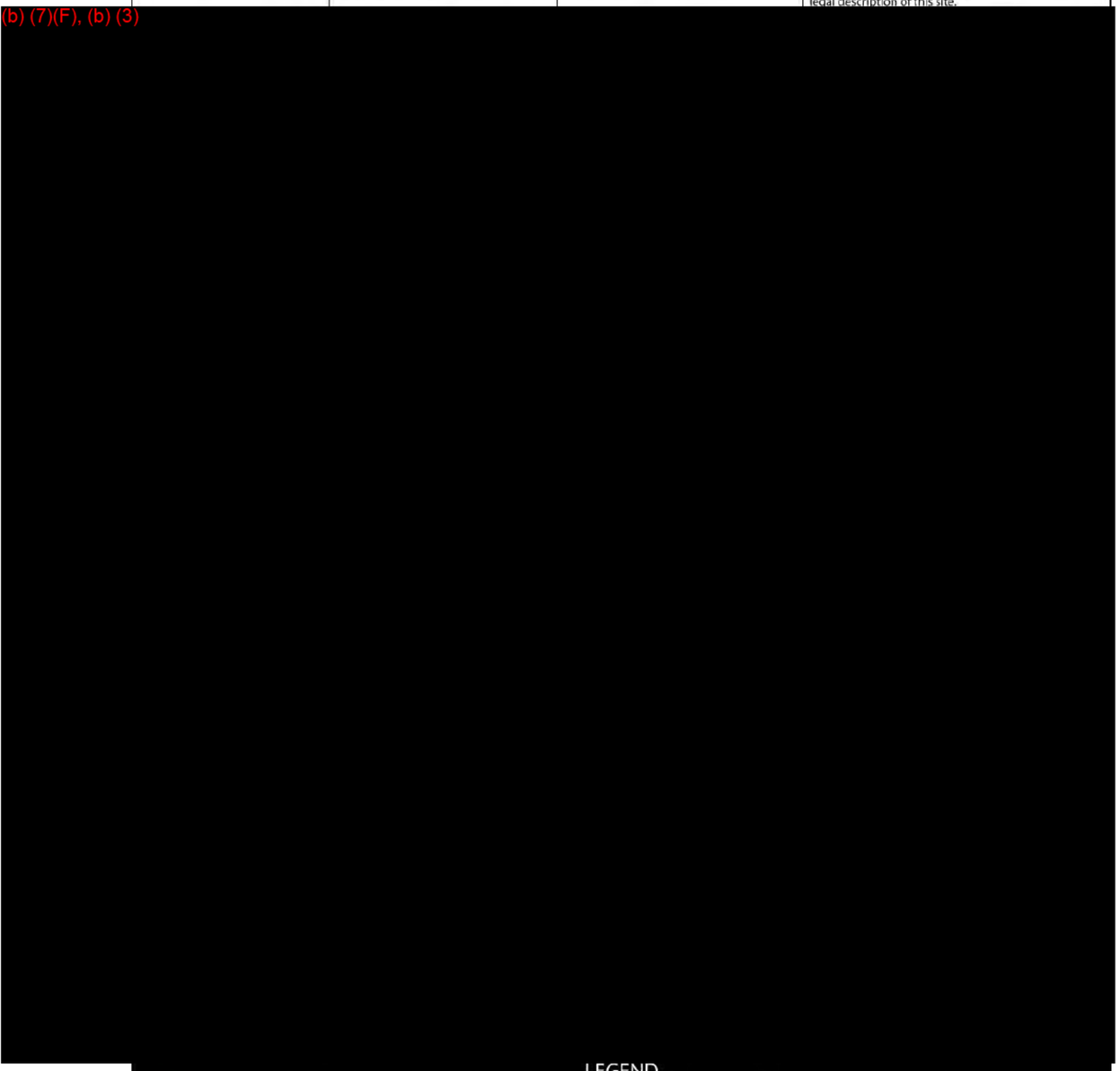
Wildlife Sensitivities: moose, bear, eagle, small game

IV. General Site Description

This site has many areas of opportunity for water dams downstream of the pipeline crossing.

River Data	Staging Areas	Base Map Containment Sites	CS 10-16 Gulkana River
• Width = 50 - 150 ft. • Velocity = 2 - 8 ft./sec.	• Gulkana River Campground • Saylors Pit • PS 11 Response Base	CS 10-16 CS 10-18 CS 10-19 CS 10-20 CS 10-21 CS 11-1 CS 11-2	C-Plan Map Ref. 61 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gulkana River

CS 10-16

(b) (7)(F), (b) (3)

I. Site Location

Location Description: Richardson Hwy crossing of the Gu kana River	**Nearest Pipeline MP:** N/A	**GPS Coordinates:** (b) (7)(F), (b) (3) ,
Primary Access: Drive site is located in the campground on the downstream side of the bridge crossing	**Secondary Access:** Boat/Helicopter LZ is in the back of the campground	

II. Response Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Identify areas of opportunity to establish containment and recovery sites.

Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.

Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish air monitoring, safety zones PPE, and site layout requirements prior to beginning work.

Utilize the boom vanes to divert oil to containment and recovery sites.

Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Minimize additional impacts to the environment.

Summer Response Tactic(s): Deflection and containment booming	**Winter Response Tactic(s):** Deflection and containment booming Ice slot cutting in certain locations
Additional Containment Sites Above this Location: CS 10-17	**Additional Containment Sites Below this Location:** Sites of opportunity along river bank

III. General Site Information

Water Path: Gulkana River flows approximately seven miles to the Copper River.	**Water Variations:** Water level varies moderately according to season and weather. Gravel bars may not be vis ble at high water.
LZ Location: In the back of the campground on south side of the bridge Open pits and gravel bars upstream of the bridge	**Forward Staging Area:** Location has several campground/open pits in the area Primary staging at public campground

Nearest Pump Station/Response Base:
PS11 is thirteen miles south of the site.

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site: Gravel and sand bar with some areas of cut bank along the vegetated portions	**Vegetation Conditions at Site:** Trees and large shrubs Moderate undergrowth makes moving off established site difficult
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport (7 miles)	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF radio, ARTS, satellite phone, some cell phone coverage

Wildlife Sensitivities: Fish stream

IV. General Site Description

Gulkana River is accessible along both banks in this area.

The area is heavily visited in the summer.

Heavy rain will cause moderate river rise, resulting in a change in the booming condition.

Water level may create hazardous stream bank conditions.

River Data	Staging Areas	Base Map Containment Sites	**CS 10-17** Gulkana River
• Width = 100 - 175 ft. • Velocity = 2 - 4 ft./sec.	• Saylors Pit • 26 APL-3 • Gauging Station	CS 10-17	C-Plan Map Ref. 59 Aerial Map Ref. 336 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; Tote; C Conex; Boom; Boom Vane; P Pump; S Skimmer; Culvert Block; Culvert	Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC	Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe	Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Gulkana River — CS 10-17

I. Site Location

Location Description:
26 APL-2 crossing of Gulkana River

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

Secondary Access:
Boat or Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish multiple deflection and containment booming operations upstream and just downstream of APL crossing.
Establish multiple recovery operations to support containment activities.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming	Deflection and containment booming in open channels Ice slot cutting in specific locations
Additional Containment Sites Above this Location: Pipeline crossing of the Gulkana River approximately one mile upstream	**Additional Containment Sites Below this Location:** CS 10-16

III. General Site Information

Water Path:	Water Variations:
Gulkana River flows to the Copper River several miles downstream.	The river is primarily a single channel.
LZ Location: Primary LZ at gauging station near APL/river Secondary LZ on APL	**Forward Staging Area:** Gauging station and 26APL-2

Nearest Pump Station/Response Base:
PS11 is 31 miles away.

Response Equipment On Site (Kits and major items):
1 Standard Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Banks are gravel and sand with vegetation to bank edge. Some access points are gone at high water.	Trees and large shrubs Generally good soils of gravel and sand
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport - 25 miles	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Fish, eagle, waterfowl, moose, and bear

IV. General Site Description

Unless the water level is very low, the site is a single-channel river.

APL bridge crossing is suitable for staging recovery systems.

Multiple boom sets are possible with recovery operations.

River Data	Staging Areas	Base Map Containment Sites	CS 10-18 Dry Creek
• Width = 2 - 3 ft. • Velocity = 0 - 2 ft./sec.	• PS 11 Response Base • Along Highway Shoulder • Gulkana Airport	CS 10-16 **CS 10-18** CS 10-19 CS 10-20 CS 10-21 CS 11-1 CS 11-2	C-Plan Map Ref. 62 Aerial Map Ref. 346 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | CS: C.S. Sign | Tank | T: Tote | C: Conex | Boom | Boom Vane | P: Pump | S: Skimmer | Culvert Block | Culvert

Bridge | Highway | Boat Launch | Trail/Clearing | Water | LWC

Gate Valve | N: Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Brush | Marsh | Trees | Tussock/Tundra | Sand/Gravel

Alyeska pipeline SERVICE COMPANY

Dry Creek CS 10-18

I. Site Location

Location Description:
Richardson Highway crossing of Dry Creek

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):
Culvert block or underflow dam

Winter Response Tactic(s):
Culvert block
Oil may not reach this site in winter months

Additional Containment Sites Above this Location:
CS 10-19

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Dry Creek flows downstream approximately one mile to Copper River.

Water Variations:
The creek ranges from dry (no flow), to moderate flow during break up and rains.

LZ Location:
Staging area on east side of highway south of culvert crossing

Forward Staging Area:
Staging area near the site

Nearest Pump Station/Response Base:
PS11 Response Base four miles

Response Equipment On Site (Kits and major items):
N/A

Stream Bank Conditions at Site:
Gravel, minimal slope at culvert

Vegetation Conditions at Site:
Heavily forested except at highway ROW

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: moose, bear, eagle, small game

IV. General Site Description

Site is a large culvert crossing of Richardson Highway.

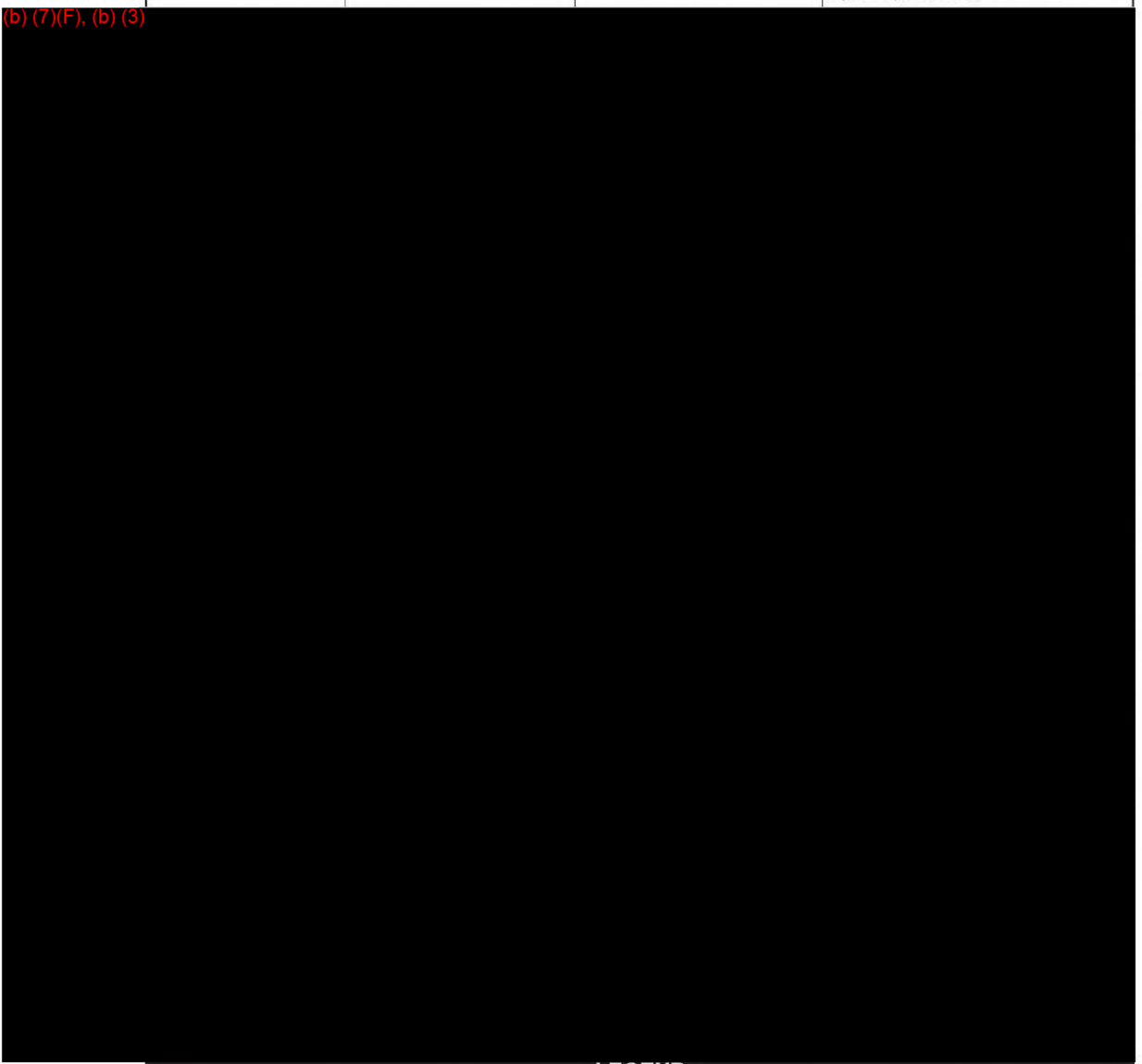
The creek is dry in the summer with some pools of water.

Open road shoulders are located along the sides of the highway.

River Data	Staging Areas	Base Map Containment Sites	CS 10-19 Dry Creek
• Width = 1 - 8 ft. • Velocity = 0 - 2 ft./sec.	• 22 APL-1 • Gulkana Airport • PS 11 Response Base	CS 10-16 CS 10-18 **CS 10-19** CS 10-20 CS 10-21 CS 11-1 CS 11-2	C-Plan Map Ref. 62 Aerial Map Ref. 347 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Dry Creek CS 10-19

I. Site Location

Location Description:	Nearest Highw	GPS Coordinates:
22 APL-1 crossing of Dry Creek	N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Establish storage and transfer operations at recovery sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Culvert block or underflow dam at culvert Containment booming upstream	Culvert block Oil may not reach this site in the winter

Additional Containment Sites Affected Above this Location:	Additional Containment Sites Below this Location:
None	CS 10-18

III. General Site Information

Water Path:	Water Variations:
Dry Creek flows approximately one mile to the Copper River.	The creek ranges from dry (no flow), to moderate flow during break up and rains.
LZ Location: On APL road	**Forward Staging Area:** On APL road

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
N/A

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Soil bank has little to no slope	Creek has shrubs and brush along the bank with trees nearby
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, bear, small game eagle

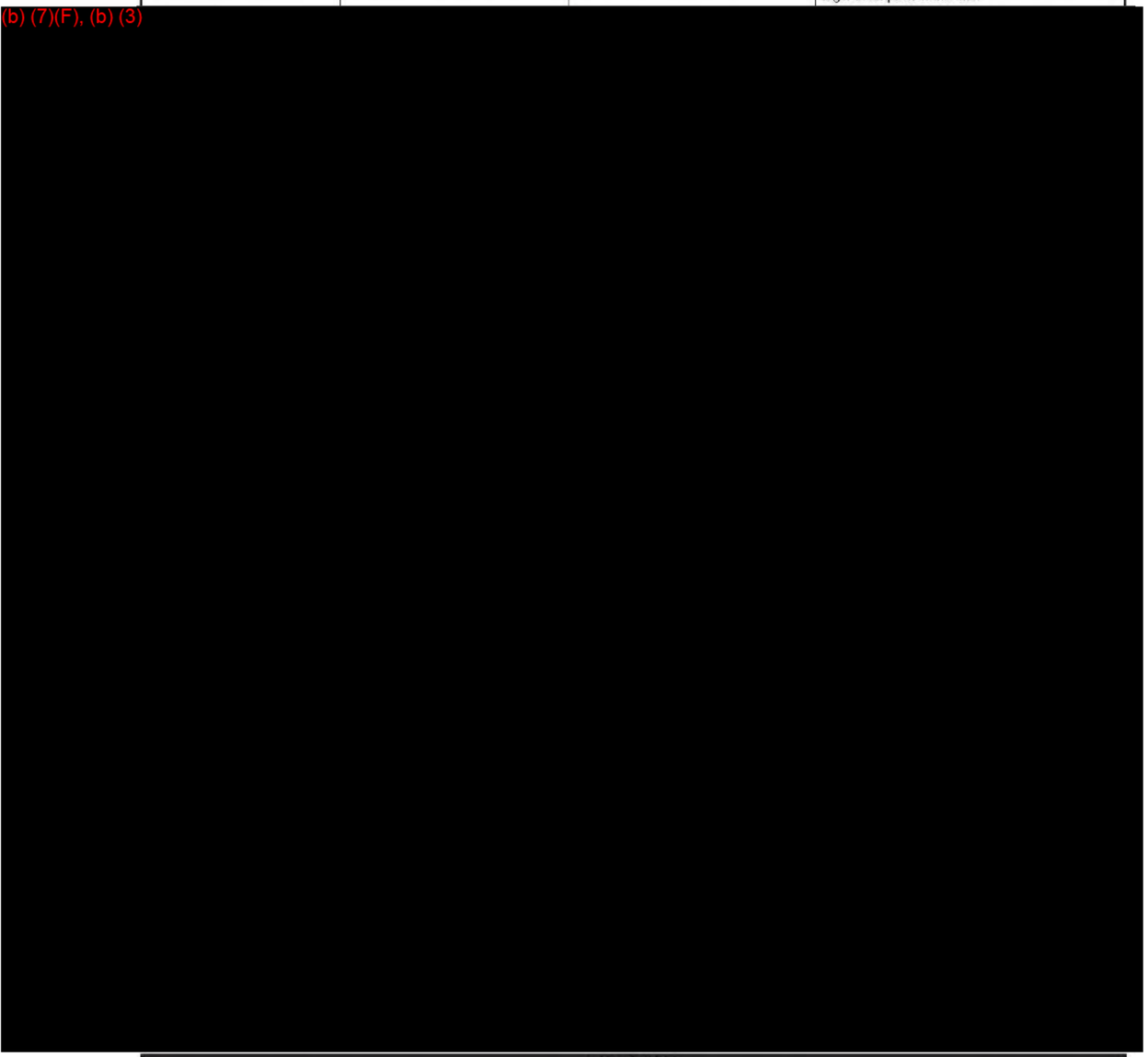
IV. General Site Description

Site is approximately three-quarters of a mile from the Richardson Highway on 22 APL-1.

River Data	Staging Areas	Base Map Containment Sites	CS 10-20 Tazlina River
• Width = 100 - 200 ft. • Velocity = 2 - 6 ft./sec.	• PS 11 Response Base • Taslina River Campground • CS 20 Access Roads	CS 10-16 CS 10-18 CS 10-19 **CS 10-20** CS 10-21 CS 11-1 CS 11-2	C-Plan Map Ref. 63 Aerial Map Ref. 352 (b) (7)(F), (b) (3) Contact APSC Land Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tazlina River — CS 10-20

(b) (7)(F), (b) (3)

I. Site Location

Location Description:
Tazlina River downstream from the camp ground

GPS Coordinates:
(b) (7)(F), (b) (3)

Primary Access:
Access roads on both sides of the river

Secondary Access:
Boat from the campground

II. Staging Area Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):
Diversion and containment booming

Winter Response Tactic(s):
Diversion and containment booming

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
None

III. General Site Information

Water Path:
Tazlina River flows under the pipeline upstream and into the Copper River downstream.

Water Variations:
The river is suscept ble to rain and seasonal influences.
The current is fast all year.

LZ Location:
On the gravel bar on the north side
Areas of opportunity on the south side

Forward Staging Area:
Tazlina River campground

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Dangerous cut bank to gradual gravel bars

Vegetation Conditions at Site:
Easy access through the trails

Location of Nearest Initial Helicopter Refueling Point:
Gulkana Airport

Utilize Additional Response Resources from:
PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: bear, eagle

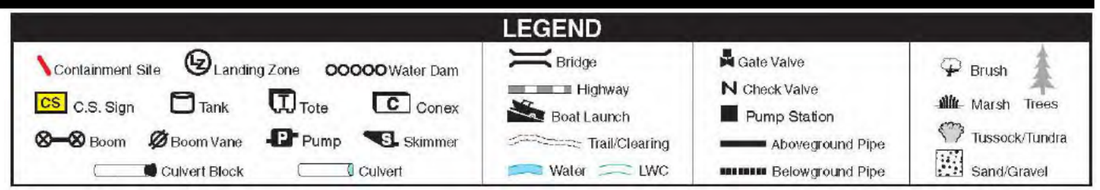
IV. General Site Description

This site is deteriorating on the south bank but several access points still exist.

A large gravel bar, gravel pit and other locations exist along the north bank.

River Data	Staging Areas	Base Map Containment Sites	CS 10-21 Moose Creek
• Width = 2 - 8 ft. • Velocity = 1 - 4 ft./sec.	• PS 11 Response Base • Bridge/dike/yard	CS 10-16 CS 10-18 CS 10-19 CS 10-20 CS 10-21 CS 11-1 CS 11-2	C-Plan Map Ref. 62 Aerial Map Ref. 349, 350 (b) (7)(F), (b) (3) [redacted] Contact AFSC Land Legal for permitted legal description of this site North

(b) (7)(F), (b) (3) [redacted]



Not to Scale

Alyeska pipeline

Moose Creek

CS 10-21

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
Confluence of Moose Creek and Tazlina River	N/A	(b) (7)(F), (b) (2) [redacted]

(b) (7)(F), (b) (3) [redacted]

Primary Access:	Secondar[redacted]
Drive Glenn Highway to PS11 access road. Site is at the end of the pipeline crossing.	Boat

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from migrating past containment site to Tazlina River.
Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy water dam system to develop recovery areas for skimmer systems.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow dam or containment boom depending on the water level	Underflow dam or containment booming depending on the water level
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
There are miscellaneous small drainages that lead into Moose Creek. Moose Creek enters the Tazlina River at this site.	The creek is suscept ble to seasonal and rain influences, with the water flow varying from nearly dry to moderate.
LZ Location: PS11 Response Base Tazlina Bridge access area	**Forward Staging Area:** Tazlina Bridge compound

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
PS11 Response Base 1/8 mile

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Steep bank gravel and clay soils	Heavily forested with undergrowth along bank Open walking along the banks
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

Site has steep banks requiring ladder access in some locations.
There are multiple access points where the ROW parallels the creek.
There are staging and support areas along the Tazlina River.
Access roads and trails are about fifteen to fifty feet above the creek.

River Data	Staging Areas	Base Map Containment Sites	CS 11-1 Yetna Creek
• Width = 2 - 4 ft. • Velocity = 0 - 3 ft./sec.	• Gravel Pit • PS 11 Response Base • Copper Center Turnout	CS 10-16 CS 10-18 CS 10-19 CS 10-20 CS 10-21 **CS 11-1** CS 11-2	C-Plan Map Ref. 63 Aerial Map Ref. 354 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Yetna Creek — CS 11-1

I. Site Location

(b) (7)(F), (b) (3) [redacted]

Location Description:	Nearest Pipeline MP:	GPS Coordinates:
Richardson Highway crossing of Yetna Creek	N/A	(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to the environment.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow dam, culvert block	Culvert block Oil may not arrive at this site in the winter
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
Yetna Creek is fed by several small drainages and enters the Copper River approximately one mile downstream.	The creek is generally stable but is susceptible to seasonal and rain influences.
LZ Location: Gravel pit east of the containment site Does not have direct access to the site	**Forward Staging Area:** Along highway ROW

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Solid stream bank Gravel and dirt banks with some slope	Heavily vegetated except at highway ROW
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base PS12

Communications Resources Available:
VHF, ARTS, cell phone, satellite phone, CB

Wildlife Sensitivities: Moose, bear, small game, eagle

IV. General Site Description

Other culvert and streams crossing locations are downstream along Hector Ewan Road.

River Data	Staging Areas	Base Map Containment Sites	CS 11-2 Klutina River
• Width = 150 ft. - 200 ft. • Velocity = 3 - 8 ft./sec.	• PS 11 Response Base • Copper Center Lodge • Local parking/RV lots	CS 10-16 CS 10-18 CS 10-19 CS 10-20 CS 10-21 CS 11-1 CS 11-2	C-Plan Map Ref. 63 (b) (7)(F), (b) (3) Contact AT SC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Klutina River

CS 11-2

I. Site Location

Location Description:
Confluence of the Klutina and Copper Rivers

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Boat/Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Minimize additional impacts to areas around the containment site.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming in fast water conditions	Diversion and containment booming in fast water conditions
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
Klutina River flows into the Copper River at this site.	The river is suscept ble to seasonal and rain influences.
LZ Location: Outside of the dyke just behind the Copper Center Lodge	**Forward Staging Area:** Copper Center Lodge

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel with some cut bank areas along the river	Heavy brush and shrub at vegetated areas Many open areas for river access
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, cell phone, ARTS, satellite phone

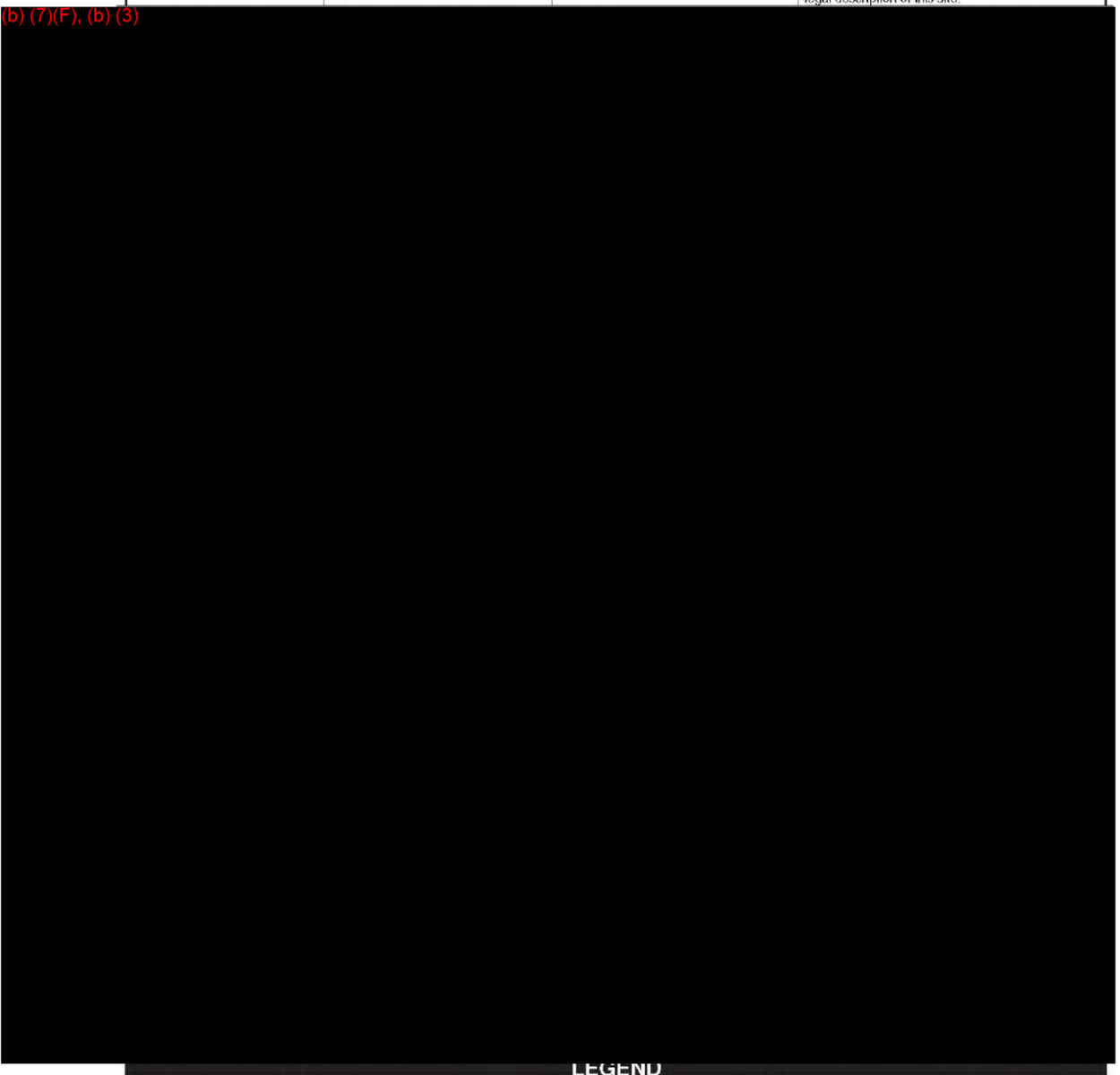
Wildlife Sensitivities: Eagle

IV. General Site Description

Site is behind the Copper River Lodge at the confluence of the Copper and Klutina Rivers.
A rapid deployment system is located above the highway bridge upstream of the site.
Additional access is on the far bank of river at numerous sites.

River Data	Staging Areas	Base Map Containment Sites	CS 11-2A Willow Lake
• Width = 2 ft. through culverts • Velocity = 0 - 1 ft./sec.	• Richardson Highway pullout • PS 11 Response Base • OMS 17-5	**CS 11-2A** CS 11-3 CS 11-4 CS 11-5	C-Plan Map Ref. 64 Aerial Map Ref. 363 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Willow Lake — CS 11-2A

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from entering Willow Lake below this site or Willow Creek N of site.
Ensure responder safety through the use of site-specific safety procedures.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish berms and trenches to contain oil on land if affected.
Establish air monitoring, safety zones, PPE, and site layout requirements prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Culvert blocks at affected culverts along the highway	Utilize snow to develop berms along affected area Culvert blocks at affected culverts by incident
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 11-3

III. General Site Information

Water Path:	Water Variations:
Site is an on-land area with belowground pipe. Willow Lake is on the other side of the highway and below grade. Willow Creek flows to the Tonsina River.	During seasonal run off, highway crossing culverts are draining snow melt from area. In the summer the site is dry.
LZ Location: OMS 17.5 Richardson Hwy pullout at Willow Lake	**Forward Staging Area:** OMS 17.5 Richardson Hwy pullout at Willow Lake

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
N/A	Downstream of culvert is forested with some wetlands at foot of slope
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, cell phone, ARTS, satellite phone

Wildlife Sensitivities: Waterfowl, bear

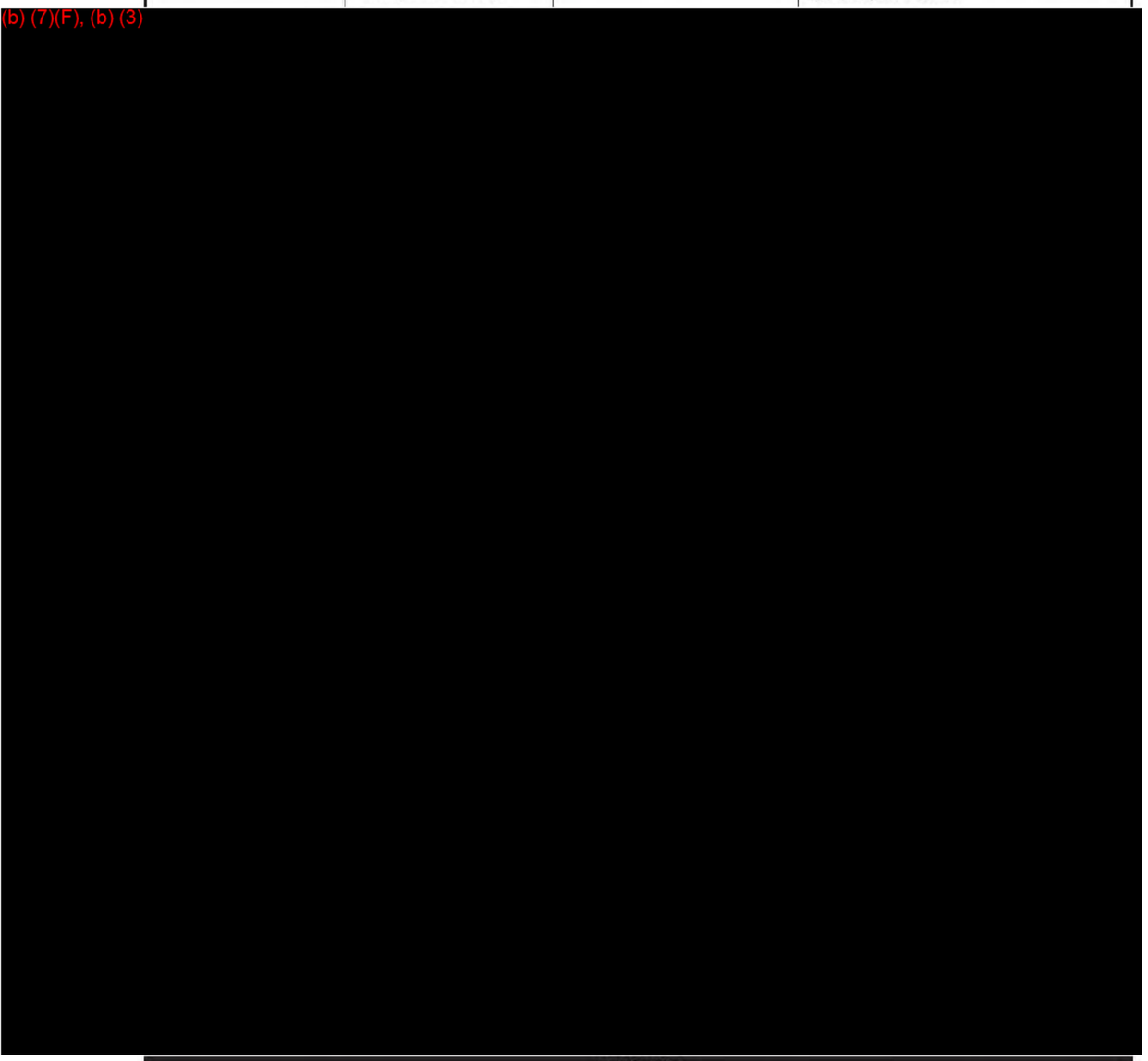
IV. General Site Description

Site is located above Willow Lake with multiple culvert crossings of the Richardson Highway.
Willow Creek crosses the Richardson Highway north of the site.
The lake has a poorly defined outlet.
The site has a steady downhill grade from the culvert outlets.

River Data	Staging Areas	Base Map Containment Sites	CS 11-3 Willow Creek
• Width = 15 - 40 ft • Velocity = 1 - 2 ft/sec	• Kenny Lake School • Highway Pullout • Chitna Airport • Kenny Lake Fire Dept.	CS 11-2A **CS 11-3** CS 11-4 CS 11-5	C-Plan Map Ref. 64E Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Willow Creek — CS 11-3

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Nearest Pipeline MP:	GPS Coordinates:
N/A	(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish containment operations at selected sites above highway crossing of creek.
Establish recovery operations at selected sites above highway crossing.
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work
Establish containment booming operations at sites of opportunity near the containment site.
Deploy culvert block and containment booming at road crossing to contain oil above the site
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Containment booming Water dams and culvert blocks as determined	Containment booming Water may not continuously flow from Willow Lake during peak winter periods.
Additional Containment Sites Above this Location: CS 11-2A	**Additional Containment Sites Below this Location:** CS 11-4

III. General Site Information

Water Path:	Water Variations:
Willow Creek flows approximately one mile to the Tonsina River. Willow lake is several miles upstream of the site.	The creek is primarily a slow wandering creek which is suscept ble to seasonal influences.
LZ Location: At vehicle pullout west of site 1/8 mile	**Forward Staging Area:** At vehicle pullout 1/8 mile west of site

Nearest Pump Station/Response Base:
PS11 Response Base approximately 35 miles

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Creek has easy access at highway site along both up and downstream locations. Some cut bank at sites located farther away from highway	Boreal forest Heavy trees and brush in area Public traffic has created trails up and downstream of site
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF and cell phone

Wildlife Sensitivities: Fish, eagle, bear, moose, waterfowl

IV. General Site Description

Site is located at the highway crossing of the creek.

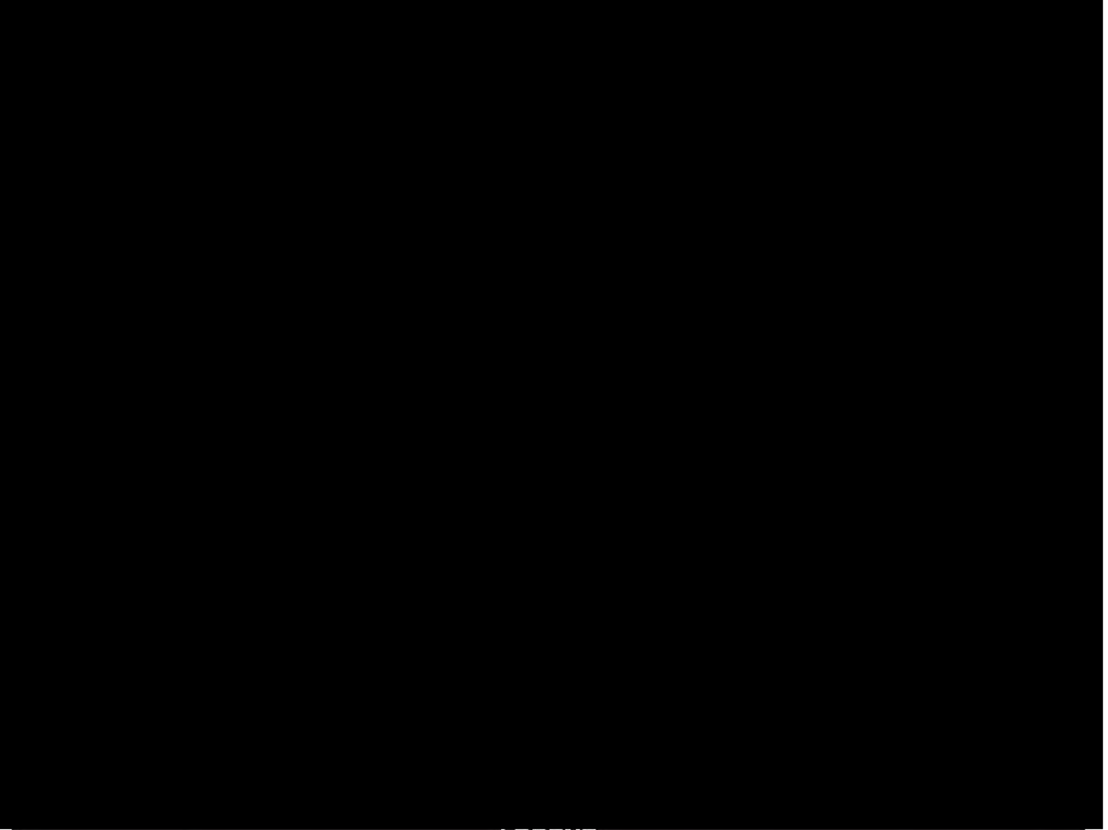
Several beaver dams exist approximately one-eighth mile upstream of site. It is not known if the beaver dams are active.

The site is well downstream of Willow Lake.

River Data	Staging Areas	Base Map Containment Sites	CS 11-4 Tonsina River
• Width = 100 - 150 ft. • Velocity = 3 - 6 ft./sec.	• Highway Work Pad	CS 11-2A CS 11-3 **CS 11-4** CS 11-5	C-Plan Map Ref. 64EA Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Tonsina River — CS 11-4

I. Site Location

(b) (7)(F), (b) (3)

Nearest Pipeline MP:	GPS Coordinates:
N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from migrating past this site and entering the Copper River.
Ensure responder safety through use of site-specific safety procedures
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work
Utilize the boom vanes to divert oil to containment and recovery sites
Establish recovery, storage, transfer systems and procedures at containment sites
Minimize additional impacts to areas around the containment site

Summer Response Tactic(s):	Winter Response Tactic(s):
Diversion and containment booming	Diversion and containment booming
Additional Containment Sites Above this Location: CS 11-7 CS 11-6 CS 11-5	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
Tonsina River enters the Copper River approx three-quarters of a mile downstream of the site.	The river is suscept ble to seasonal and rain influences.
LZ Location: Along Edgerton Highway as identified	**Forward Staging Area:** Highway pad Containment site

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River has some areas of easy access. Primarily cut bank upstream of site	Boreal forest Heavy undergrowth below trees Access beyond public paths limited
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, CB

Wildlife Sensitivities: Fish, bear, moose, eagle, and waterfowl

IV General Site Description

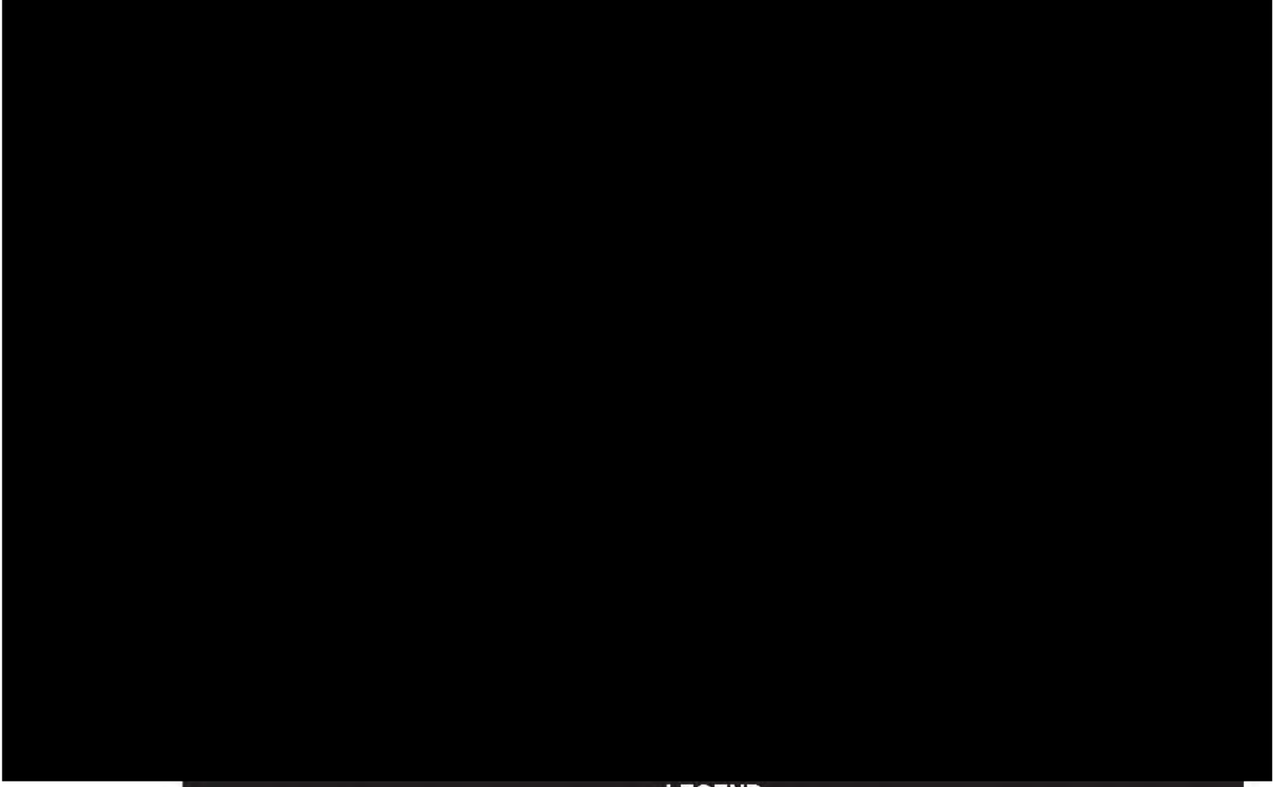
The site lies at the crossing of the Edgerton Highway and Tonsina River.

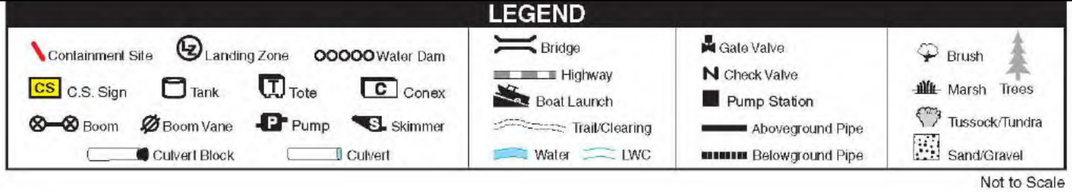
The site has available public and private access roads and paths in the area.

The primary focus should be on upstream locations as the Copper River is shortly downstream.

River Data	Staging Areas	Base Map Containment Sites	CS 11-5 Squirrel Creek
• Width = 2 - 6 ft. • Velocity = 2 - 6 ft./sec.	• Squirrel Creek Campground • PS 11 Response Base • Tonsina Lodge/Airport	CS 11-2A CS 11-3 CS 11-4 CS 11-5	C-Plan Map Ref. 65 Aerial Map Ref. N/A (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)





Not to Scale

Alyeska pipeline SERVICE COMPANY

Squirrel Creek — CS 11-5

I. Site Location

(b) (7)(F), (b) (3)

Nearest Pipeline MP:	GPS Coordinates:
N/A	(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):

Prevent oil from migrating past this site to enter the Tonsina River.

Ensure responder safety through the use of site-specific safety procedures.

Establish water dam containment at sites where oil recovery can be optimized

Minimize additional impacts to the environment

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work

Establish containment booming operations at sites of opportunity near the containment site

Deploy water dam system to develop recovery areas for skimmer systems

Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow dams or MegaSecur dams at low water or in select locations Containment booming at multiple sites along creek up and downstream of highway crossing	Underflow dams or MegaSecur dams at low water or in select locations Containment booming at multiple sites along creek up and downstream of highway crossing

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 11-4

III. General Site Information

Water Path:	Water Variations:
Squirrel Creek flows under the pipeline above this site and is at the confluence with Tonsina River at this location.	The creek collects drainage from the valley to the west. It is susceptible to seasonal and rain influences.
LZ Location: In Squirrel Creek campground near pond	**Forward Staging Area:** At Squirrel Creek campground

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Creek banks are heavily traveled up and downstream of site. Many accessible locations Stream banks are minimal with soils, gravel, and rock	Boreal forest Heavily forested although campsite development has allowed for easy access and trails
Location of Nearest Initial Helicopter Refueling Point: Gulkana Airport	**Utilize Additional Response Resources from:** PS11 Response Base

Communications Resources Available:
VHF and cell phone

Wildlife Sensitivities: Fish, bear, eagle

IV. General Site Description

The site lies within the Squirrel Creek campground.

Site access allows for support of incidents involving the Tonsina River.

Site has multiple access points on the Tonsina River and Squirrel Creek via a trail system and access gates.

River Data	Staging Areas	Base Map Containment Sites	CS 11-6 Little Tonsina River
• Width = 8 - 30 ft. • Velocity = 2 - 6 ft./sec.	• 14 APL-4 • PS 11, 12 Response Base • OMS 14-1 • Tonsina Lodge • Richardson Hwy. Pullout	CS 11-5 **CS 11-6** CS 11-7	C-Plan Map Ref. 66 Aerial Map Ref. 369 (b) (7)(F), (b) (3) Contact AP SC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



Not to Scale

Alyeska pipeline SERVICE COMPANY

Little Tonsina River — CS 11-6

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from migrating past site and entering the Tonsina River.

Tactical Response Objective(s):
Establish containment at site and areas of opportunity along the Little Tonsina River at this location.
Establish containment at confluence of Little Tonsina and Tonsina Rivers.
Establish recovery operations at selected sites along lower Little Tonsina area.

Summer Response Tactic(s):	Winter Response Tactic(s):
Deflection and containment booming Underflow dam possible at certain low water/gravel bar areas	Possible ice slotting at selected sites along river Deflection and containment booming Underflow dam possible at certain low water/gravel bar areas
Additional Containment Sites Affected Above this Location: CS 11-7	**Additional Containment Sites Below this Location:** CS 11-5 Squirrel Creek (confluence of creek and Tonsina River and is accessible for spills in the Tonsina) CS 11-4

III. General Site Information

Water Path:	Water Variations:
Small creeks and drainages feed this area above and below CS 11-7. Site is one-eighth of a mile from confluence with Tonsina River.	The river is typically slow moving with eddies and pooling areas available for sites of opportunity. It is susceptible to seasonal and rain influences.
LZ Location: OMS 14-1 at west end of site	**Forward Staging Area:** OMS 14-1 at west end of site Pullout at intersection of APL and highway

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom, Raft (stored at GRB)

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
River area is heavily accessed by public and accessible along downstream side via road and trails. Upstream consists of wa king trails and paths. Area has step down banks and is generally easy to access.	Coastal forest Trees and large brush along steam banks Some low lying areas of marsh and bog upstream of site
Location of Nearest Initial Helicopter Refueling Point: Valdez and Gulkana Airports	**Utilize Additional Response Resources from:** PS11 Response Base and SERVS/VMT

Communications Resources Available:
VHF and cell phone

Wildlife Sensitivities: Fish, eagle, bear, and moose

IV. General Site Description

Oil to this site would enter the Little Tonsina upstream of CS 11-7.

The area upstream of the site is easily access ble by using the Richardson Highway as a starting point.

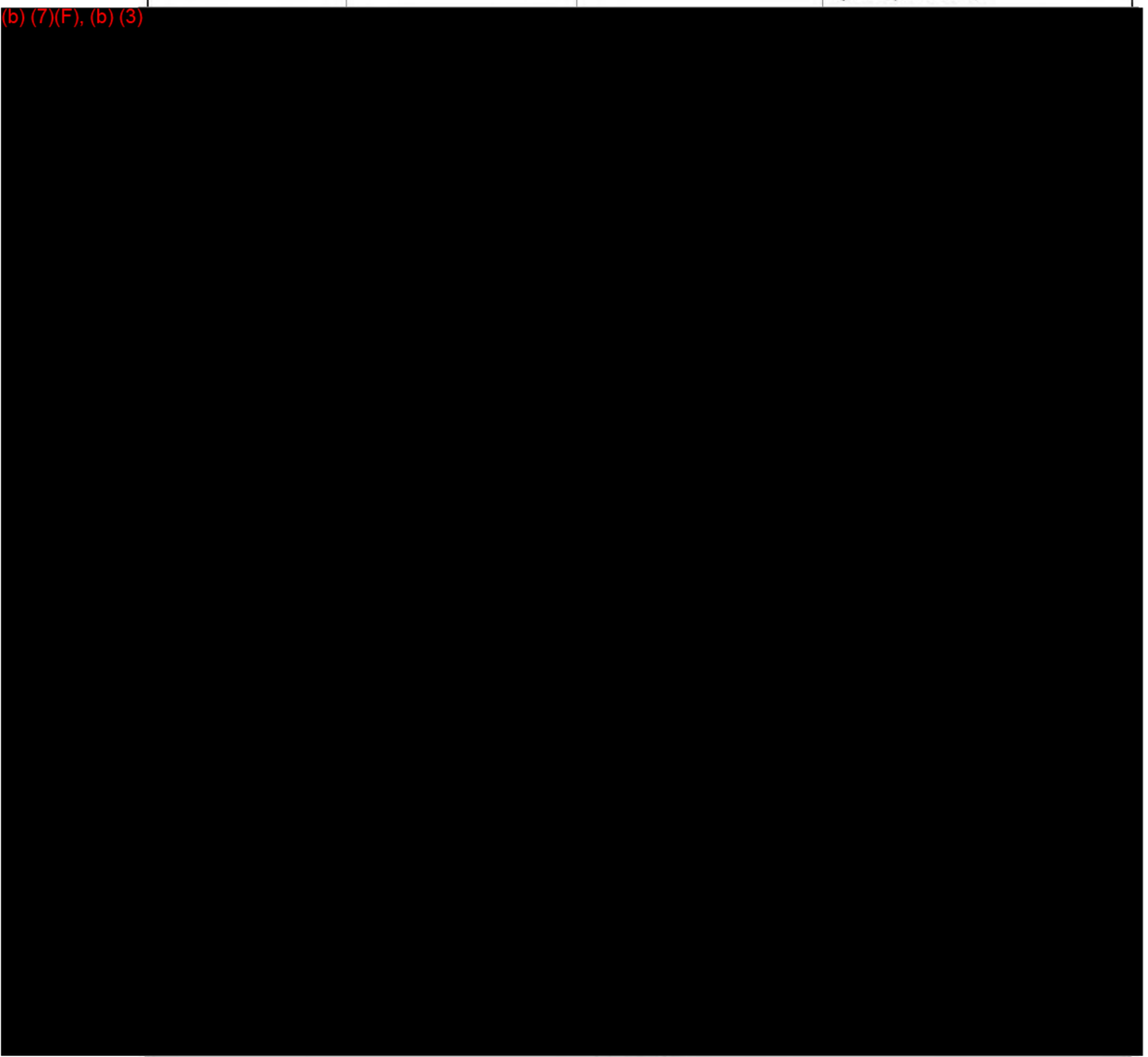
Site will require security as a result of location.

Site has minimal tank storage area on the upstream (west) side of the river behind trees.

Culverts are 11 inches and 4 feet with a smaller one under water at normal flow.

River Data	Staging Areas	Base Map Containment Sites	CS 11-7 Little Tonsina River
• Width = 10 - 30 ft. • Velocity = 1 - 3 ft./sec.	• PS 12 Yard • Disposal Site • State Campground @ PS 12	CS 11-5 CS 11-6 **CS 11-7**	C-Plan Map Ref. 67 Aerial Map Ref. 374, 375 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
CS C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Little Tonsina River — CS 11-7

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from migrating to the water if spill is on land.
Ensure responder safety through the use of site-specific safety procedures
Establish containment at sites where oil recovery, storage and transport can be optimized
Minimize additional impacts to the environment

Tactical Response Objective(s):
Establish berms and trenches to contain oil on land if spill is land based.
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work
Establish containment booming operations at sites of opportunity near the containment site
Establish storage and transfer operations at recovery sites

Summer Response Tactic(s):	Winter Response Tactic(s):
Possible use of trenches and other land tactics if spill occurs to land first	Possible use of trenches and other land tactics if spill occurs to land first
Possible culvert block at highway crossing during low flow	Possible culvert block at highway crossing during low flow
Deflection booming in areas of marsh and low terrain	Containment booming at areas of opportunity along river
Containment booming at areas of opportunity along river	

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	CS 11-5 access to Tonsina River Areas of opportunity along the Richardson Highway above CS 11-6

III. General Site Information

Water Path:	Water Variations:
The Little Tonsina River is fed by numerous drainages. The river meanders and flows fairly slowly through the PS12 area.	The river is suscept ble to seasonal and rain influences. With the exception of some low areas, the river tends to stay in the banks.
LZ Location: PS12 helicopter site, campground on the W side of the highway	**Forward Staging Area:** PS12 or the campground across from the station

Nearest Pump Station/Response Base:
SERVS/VMT 65 miles PS11 Response Base 45 miles

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Bank conditions range from cut bank and poor soil shoulders to marsh and grass low areas with no definition. Anticipate many banks to be soft and not well defined Good access at the pipe crossing	Heavy vegetation with trees, shrubs, and tall grasses present in all areas Numerous access paths in this area
Location of Nearest Initial Helicopter Refueling Point: Valdez or Gulkana Airports	**Utilize Additional Response Resources from:** SERVS/VMT PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Fish, eagle, waterfowl, moose, and bear

IV. General Site Description

Site is directly out the back gate from PS12.

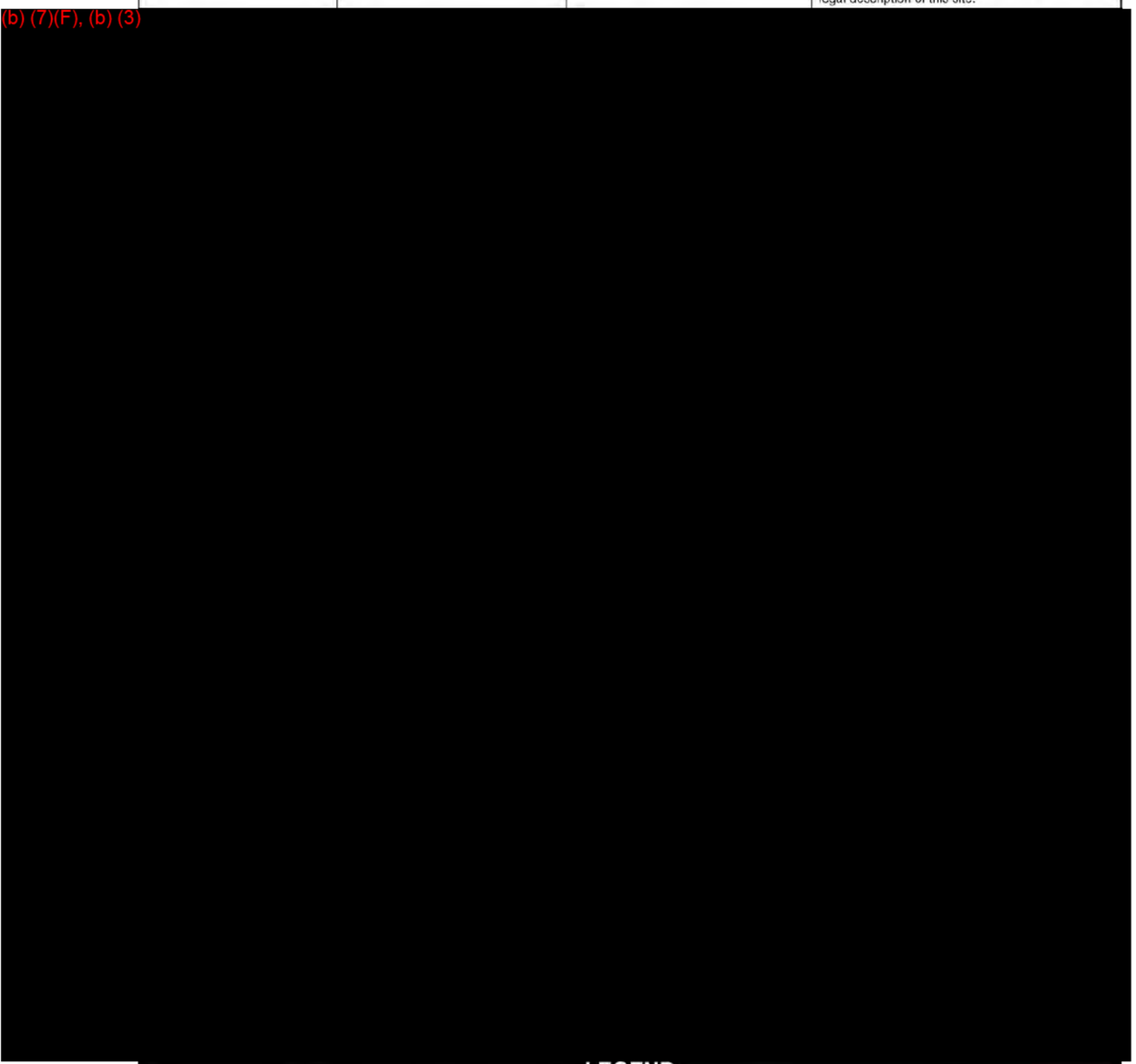
River meanders a little and enters a large marsh area just before passing under the Richardson Highway.

Numerous areas of opportunity allow for easy access to the river both upstream of the site and past the highway crossing, such as the Old Tonsina

(b) (7)(F), (b) (3)

River Data	Staging Areas	Base Map Containment Sites	CS 12-1 Tiekel River
• Width = 50 - 75 ft. • Velocity = 2 - 8 ft./sec. Seasonal	• 10 APL-3/Pit • Highway Turnout RHMP 51.8	**CS 12-1** CS 12-2 CS 12-4 CS 12-5	C-Plan Map Ref. 68 Aerial Map Ref. 384 (b) (7)(F), (b) (3) Contact AP-SC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · CS C.S. Sign · Tank · T Tote · C Conex · Boom · Boom Vane · P Pump · S Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · N Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tiekel River — CS 12-1

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through the use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.
Deploy portable pipeline and hose transfer systems to remove oil from storage systems at the site.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming Possible use of underflow dams at certain locations or river conditions	Diversion and containment booming Possible use of underflow dams at certain locations during low water
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 12-2 Areas of opportunity along river

III. General Site Information

Water Path:	Water Variations:
Tiekel River supports mountain drainages and flows downstream several miles to the Tsina River.	River is moderately suscept ble to seasonal and rain influences. Typically, the river is in a single channel at this location with some stream bank. Gravel bars are available at low water levels.
LZ Location: Gravel pit near OMS 10 APL-3	**Forward Staging Area:** Gravel pit near OMS 10 APL-3 Access road that parallels the river at this site

Nearest Pump Station/Response Base:
SERVS/VMT 52 miles
PS11 Response Base 55 miles

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Access road is above the river by twenty to thirty feet. Access trails are steep and typically drop right to water's edge. At areas farther south of the site, access is easier. Gravel and small rock with moderate soil	Heavy trees and vegetation Undergrowth can make walking difficult
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport	**Utilize Additional Response Resources from:** SERVS/VMT, PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Fish, moose, eagle, waterfowl, and bear

IV. General Site Description

Site is located below the old highway.

There are steep banks in some areas with easy access in others.

Areas of containment and recovery opportunity are located above and below the site.

A trail is established from the road to the site.

Bank may be undercut along edges due to seasonal flooding.

River configuration tends to create pools and shallow water areas along both banks.

River Data	Staging Areas	Base Map Containment Sites	CS 12-2 Tiekel River
• Width = 20 - 30 ft. • Velocity = 2 - 6 ft./sec.	• Mt. Billy Mitchell Campground • OMS 9-4R • 10 APL-0 • PS 12	CS 12-1 **CS 12-2** CS 12-4 CS 12-5	C-Plan Map Ref. 68 Aerial Map Ref. 386 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3)

LEGEND

Containment Site · Landing Zone · Underflow Dam · CS C.S. Sign · Tank · T Tote · C Conex · Boom · Boom Vane · P Pump · SL Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale • 10/2013

Alyeska pipeline SERVICE COMPANY

Tiekel River — CS 12-2

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter to Billy Mitchell Campground

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from migrating past this site to CS 12-3C.
Ensure responder safety through use of site-specific safety procedures
Establish containment at sites where oil recovery, storage and transport can be optimized
Minimize additional impacts to the environment

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work
Establish containment booming operations at sites of opportunity near the containment site
Deploy recovery and transfer systems at associated containment sites
Minimize additional impacts to areas around the containment site

Summer Response Tactic(s):	Winter Response Tactic(s)
Possible use of underflow dams at low water channels Diversion and containment booming	Possible use of underflow dams at low water channels Diversion and containment booming
Additional Containment Sites Above this Location: CS 12-1	**Additional Containment Sites Below this Location:** CS 12-3C Areas of opportunity above 12-3C

III. General Site Information

Water Path:	Water Variations:
Tiekel River is fed by mountain drainages. It flows past this site several miles to the Tsina River.	The river is generally not fast moving except during Spring breakup. The river tends to develop pools and eddies at mean water levels. It typically is in a single channel at this location.
LZ Location: Billy Mitchell Campground	**Forward Staging Area:** Billy Mitchell Campground, 10 APL-0

Nearest Pump Station/Response Base:
SERVS/VMT 32 miles
PS11 Response Base 70 miles

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stream largely parallels the old highway. Some steep banks with areas to access the river Consistent gravel and dirt soils	Coastal forest Large amount of trees and heavy brush in the area Good soils for support of vegetation along river bank
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport	**Utilize Additional Response Resources from:** SERVS/VMT, PS11 Response Base 1 CS 12-3A, 12-3C

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Fish, eagle, waterfowl, moose, and bear

IV. General Site Description

Site lies almost directly behind the Billy Mitchell Campground and the east bank can be accessed by walking out of the back of the campground.

Old Richardson Highway parallels the river at many locations downstream of the site.

Heavy brush and overgrowth along the old highway may prevent large trucks from moving up the Old Richardson Highway.

River takes a number of bends and meanders a short distance upstream where there are areas of pooling for oil recovery.

River Data	Staging Areas	Base Map Containment Sites	CS 12-3 Tsina River
• Width = 100 - 150 ft. • Velocity = 4 - 8 ft./sec.	(b) (7)(F), (b) (3) [redacted]	CS 12-3 CS 12-3A CS 12-3C	C-Plan Map Ref. 69 Aerial Map Ref. 387 (b) (7)(F), (b) (3) [redacted] Contact APSC Land/Legal for permitted legal description of this site. North

(b) (7)(F), (b) (3) [redacted]

LEGEND

Containment Site; Landing Zone; Water Dam; CS C.S. Sign; Tank; Tote; Conex; Boom; Boom Vane; Pump; Skimmer; Culvert Block; Culvert; Bridge; Highway; Boat Launch; Trail/Clearing; Water; LWC; Gate Valve; Check Valve; Pump Station; Aboveground Pipe; Belowground Pipe; Brush; Marsh; Trees; Tussock/Tundra; Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tsina River — CS 12-3

I. Site Location

(b) (7)(F), (b) (3) [redacted]

GPS Coordinates:
(b) (7)(F), (b) (3) [redacted]

(b) (7)(F), (b) (3) [redacted]

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):

Prevent oil from migrating past this site and entering the Copper River.
Ensure responder safety through use of site-specific safety procedures.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy deflection boom to divert oil to containment and recovery areas.
Establish recovery, storage, transfer systems and procedures at containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming	Diversion and containment booming with possible use of underflow dams at selected side channels depending on water level

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 2-3A if spill is in the Tsina River	None

III. General Site Information

Water Path:	Water Variations:
The confluence with the Stuart Creek is just upstream of this site. The Tsina River flows to the Copper River several miles downstream.	The river is significantly susceptible to seasonal and rain influences. The water current is consistently fast.
LZ Location: Gravel clearing at Richardson Highway intersection with 9 APL-3B	**Forward Staging Area:** Gravel clearing at Richardson Highway intersection with 9 APL-3B

Nearest Pump Station/Response Base:
SERVS/VMT-45 miles
PS11 Response Base-60 miles

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, 1 Auxiliary Conex, Boom stored at OMS 9-4

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel and large rock Fast water conditions make bank navigation possible only under low water. Minimal soils present	Large trees in some areas near the site. Heavy brush and shrubs along river bank
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport	**Utilize Additional Response Resources from:** SERVS/VMT, PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, CB

Wildlife Sensitivities: Eagle, moose, bear.

IV. General Site Description

Site is located at the end of the APL road at (b) (7)(F), [redacted]

There is a boat ramp for rafters at the site that deploys directly off the APL road.

Public access road (marginal) is available on the west bank and follows the river for several hundred yards upstream.

River Data	Staging Areas	Base Map Containment Sites	CS 12-3A Tsina River
• Width = 100 - 150 ft. • Velocity = 2 - 8 ft./sec.	• 8 APL-2 • OM9 94R	CS 12-3 **CS 12-3A** CS 12-3C	C-Plan Map Ref. 68 Aerial Map Ref. 390 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site	Bridge	Gate Valve	Brush
Landing Zone	Highway	Check Valve	Marsh
Water Dam	Boat Launch	Pump Station	Trees
C.S. Sign	Trail/Clearing	Aboveground Pipe	Tussock/Tundra
Tank	Water	Belowground Pipe	Sand/Gravel
Tote	LWC		
Conex			
Boom			
Boom Vane			
Pump			
Skimmer			
Culvert Block			
Culvert			

Not to Scale

Alyeska pipeline SERVICE COMPANY

Tsina River — CS 12-3A

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Maximize recovery by deflecting oil to areas of recovery opportunity and use of decanting procedures.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Utilize the boom vanes to divert oil to containment and recovery sites.
Deploy recovery and transfer systems at associated containment sites.
Utilize decanting procedures to maximize oil storage and transfer needs.

Summer Response Tactic(s):
Diversion and containment booming for fast water conditions
Recovery tactics at selected locations downstream

Winter Response Tactic(s)
Diversion and containment booming for fast water conditions

Additional Containment Sites Above this Location:
None

Additional Containment Sites Below this Location:
CS 12-3

III. General Site Information

Water Path:
The Tsina River flows for several miles past this location to the Copper River.

Water Variations:
This area acts as drainage for a large mountain valley, and so water levels change regularly.
The current is fast in all seasons.

LZ Location:
Richardson Highway turn out north of site
8 APL 2 access road

Forward Staging Area:
8 APL-2 and ROW along the area

Nearest Pump Station/Response Base:
SERVS/VMT-40 miles
PS11 Response Base-60 miles

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, Boom

Stream Bank Conditions at Site:
Gravel and large rock
Fast water conditions make bank travel hazardous.
At low water levels, some bank travel may be available

Vegetation Conditions at Site:
Boreal forest
Heavy brush and shrub with some tree areas along bank

Location of Nearest Initial Helicopter Refueling Point:
Valdez Airport

Utilize Additional Response Resources from:
SERVS/VMT, PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Fish, bear, waterfowl, eagle

IV. General Site Description

Site is located at the APL and pipe crossing of the Tsina River. The river has a fast current in all seasons.

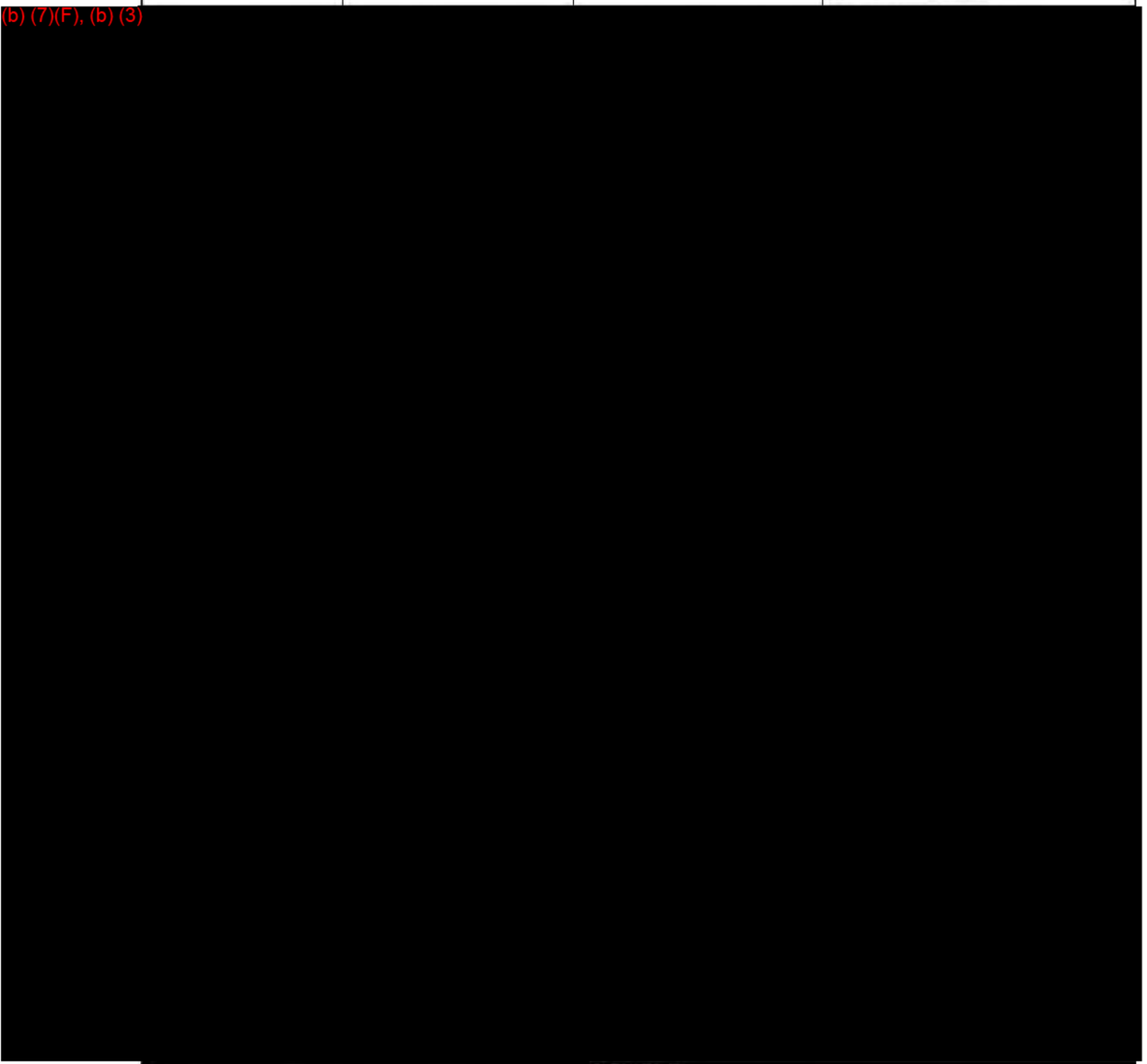
Fast water and large rocks makes boat navigation marginal. There are typically some gravel bars downstream for approx one-quarter mile.

Some access road and trails may be available on the upstream west side of the river depending on flood stages of the river.

Access on the east bank of the river is limited due to terrain and vegetation.

River Data	Staging Areas	Base Map Containment Sites	CS 12-3C Tiekel River
• Width = 20 - 50 ft. • Velocity = 2 - 6 ft./sec.	• OMS 9-4R • PS 11 Response Base • Mt. Billy Mitchell Campground	CS 12-3 CS 12-3A **CS 12-3C**	C-Plan Map Ref. 68, 69 Aerial Map Ref. 387 (b) (7)(F), (b) (3) Contact A-PSC Land/Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)



Not to Scale

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Tiekel River CS 12-3C

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

econdary Access:
elicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish on-land containment for spills to land.
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish containment booming operations at sites of opportunity near the containment site.
Deploy recovery and transfer systems at associated containment sites.
Minimize additional impacts to areas around the containment site.

Summer Response Tactic(s):	Winter Response Tactic(s)
Utilize trenches and berms for spills on land near the site Diversion and containment booming along areas of opportunity	Possible use of underflow dams in low water conditions Diversion and containment booming along areas of opportunity

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
CS 12-1 CS 12-2	None

III. General Site Information

Water Path:	Water Variations:
The Tiekel River flows approximately one-half mile to the Tsina River.	The river is commonly susceptible to seasonal and rain influences, resulting in high water levels. In peak summer months, the river can be crossed on foot.
LZ Location: OMS 9-4R	**Forward Staging Area:** OMS 9-4R

Nearest Pump Station/Response Base:
PS11 Response Base

Response Equipment On Site (Kits and major items)::
1 Standard Conex, Boom stored at OMS 9-4R

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Gravel and sand composition with cut banks along both sides	Boreal forest Heavy vegetation and trees along the bank Underbrush can make movement difficult in peak summer season
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport	**Utilize Additional Response Resources from:** SERVS/VMT, PS11 Response Base

Communications Resources Available:
VHF, ARTS, satellite phone, CB

Wildlife Sensitivities: Eagle, waterfowl, moose, and bear

IV. General Site Description

Site is located on the east side of the ROW down a short road to the river bank.

There are numerous areas of opportunity along the river from the highway crossing upstream to areas just downstream of this site.

There is an old oxbow upstream of this site that could be utilized for potential oil storage.

Navigation by small boat may be possible in higher water conditions.

River Data	Staging Areas	Base Map Containment Sites	CS 12-4 Ptarmigan Creek
• Width = 10 - 40 ft. Braided Channels • Velocity = 4 - 8 ft./sec.	• State DOT OMS (next to OMS 7-1M) • Airport (Worthington Glacier) • 7 APL-1A	CS 12-4	C-Plan Map Ref. 70 Aerial Map Ref. 395 (b) (7)(F), (b) (3) Contact AFSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site	Landing Zone	Water Dam	Bridge	Gate Valve	Brush
C.S. Sign	Tank	Tote	Conex	Highway	Check Valve	Marsh / Trees
Boom	Boom Vane	Pump	Skimmer	Boat Launch	Pump Station	Tussock/Tundra
Culvert Block	Culvert		Trail/Clearing	Aboveground Pipe	Sand/Gravel
			Water / LWC	Belowground Pipe	

Not to Scale

Alyeska pipeline SERVICE COMPANY

Ptarmigan Creek — CS 12-4

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates: (b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Location may have weather restrictions due to narrow valley and clouds.

II. Response Objectives and Data

Strategic Response Objective(s):
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized
Minimize additional impacts to the environment

Tactical Response Objective(s):
Establish on land containment at spill site to prevent oil from entering Ptarmigan Creek.
Establish culvert blocks at effected culverts along the Richardson Highway.
Establish deflection/containment boom systems at 7 APL-1A access road.
Establish recovery systems at collection points.

Summer Response Tactic(s):
Utilize trenches, gravel, or other means to develop containment on land
Establish culvert blocks at affected culverts and deploy CS
Deploy diversion and containment boom sets along creek as determined.

Winter Response Tactic(s)
Utilize snow, gravel shore boom, or other means to develop containment on land
Establish culvert block at affected drainage if water is present
Deploy boom or possible underflow dam downstream in open water areas

Additional Containment Sites Above this Location:
CS 12-5 depending on PLMP of spill and trajectory

Additional Containment Sites Below this Location:
CS 12-3 CS 12-3A
Areas of opportunity on Ptarmigan Creek above confluence with the Tsina River

III. General Site Information

Water Path:
Worthington Glacier and adjoining slope drainage enters Ptarmigan Creek upstream and flows past this site to the Tsina River approximately one-quarter mile downstream.

Water Variations:
The river is suscept ble to seasonal and rain influences. The water level can rise rapidly due to lack of soils and slope runoff.

LZ Location:
Primary LZ located in AKDOT pit located just past (W) the access road crossing of Ptarmigan Creek
Additional support zone located at Worthington Glacier Airstrip

Forward Staging Area:
AKDOT pit located just past (W) the access road crossing of Ptarmigan Creek or Worthington Glacier Airstrip

(b) (7)(F), (b) (3)

Response Equipment On Site (Kits and major items):
1 Enhanced Standard Conex, Boom, Sandbags

Stream Bank Conditions at Site:
Ground is generally flat with minimal banks and composed of gravel deposits with little bank and gravel bar access available at high water conditions.
Minimal soil present

Vegetation Conditions at Site:
Heavy vegetation along banks with large brush and trees
Low water may allow for movement along stream banks.
At culvert locations, access is open.

(b) (7)(F), (b) (3)

Utilize Additional Response Resources from:
Valdez, PS12 and Glennallen Response Base located at PS11

Communications Resources Available:
VHF, ARTS, satellite phone

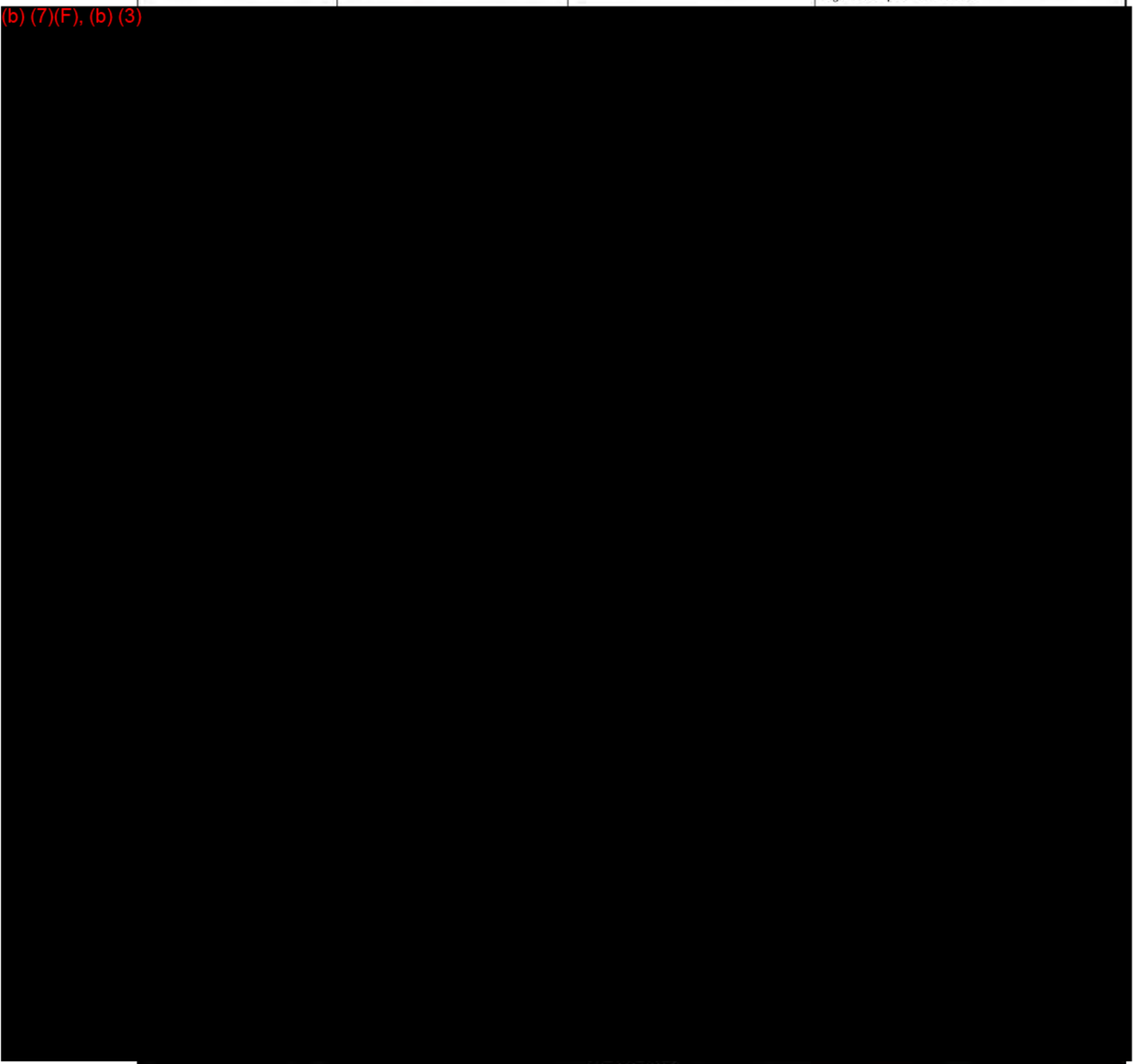
Wildlife Sensitivities: Bear, eagle, small game

IV. General Site Description

Site has access trails located up and downstream of the bridge crossing and out the back of the clearing near the conex.
The Tsina River lies approximately one-quarter mile downstream of the containment site.
There are several culverts located between (b) (7)(F), (b) (3) that may be activated as a result of a spill from that section of pipe and containment actions taken at those sites as well.
Sites will require active monitoring of water conditions as water storage behind the culverts is minimal.
Ptarmigan Creek is a braided fast water channel of glacier runoff from Worthington Glacier and surrounding slopes.
Water levels will determine the number of gravel bars and access points available in the area.
Conex is located across the APL road crossing of Ptarmigan Creek in the gravel pit.

River Data	Staging Areas	Base Map Containment Sites	CS 12-5 27-Mile Glacier Creek
• Width = 2 - 30 ft. Braided Channels • Velocity = 3 - 8 ft./sec.	• 6 APL-2 • 6 Highway Turnout • Airport (Worthington Glacier)	CS 12-1 CS 12-2 CS 12-4 **CS 12-5**	C-Plan Map Ref. 71 Aerial Map Ref. 398 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

(b) (7)(F), (b) (3)



LEGEND

Containment Site · Landing Zone · Water Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Bridge · Highway · Boat Launch · Trail/Clearing · Water · LWC

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Brush · Marsh · Trees · Tussock/Tundra · Sand/Gravel

Not to Scale

Alyeska pipeline SERVICE COMPANY

27-Mile Glacier Creek

CS 12-5

I. Site Location

(b) (7)(F), (b) (3)	**Nearest Pipeline MP:** N/A	**GPS Coordinates:** (b) (7)(F), (b) (3) ,
(b) (7)(F), (b) (3)	**Secondary Access:** Helicopter	

II. Response Objectives and Data

Strategic Response Objective(s):

Prevent oil from migrating off the ROW and into drainages above Ptarmigan Creek.
Ensure responder safety through the use of site-specific safety procedures.
Establish water dam containment at sites where oil recovery can be optimized.
Establish culvert block containment to maximize recovery options.
Minimize additional impacts to the environment.

Tactical Response Objective(s):

Establish on-land containment at spill site to prevent oil from entering Ptarmigan Creek.
Establish deflection/containment boom systems at 6 APL-2 access road.
Establish recovery systems at collection points.
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Deploy culvert block and containment booming at road crossing to contain oil above the site.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Utilize trenches, gravel, or other means to develop containment on land Establish culvert blocks at affected culverts and deploy CS Deploy diversion and containment boom sets or underflow dams along creek as determined	Utilize snow, gravel shore boom, or other means to develop containment on land Establish culvert block at affected drainage if water is present Deploy boom or possible underflow dam downstream in open water areas
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** CS 12-6

III. General Site Information

Water Path: Worthington Glacier and adjoining slope drainage enters Ptarmigan Creek upstream and flows past this site to the Tsina River approximately two miles downstream.	**Water Variations:** The river is suscept ble to seasonal and rain influences. The water level can rise rapidly due to lack of soils and slope runoff.
LZ Location: In gravel pit on west side of highway at 6 APL-2	**Forward Staging Area:** In gravel pit on west side of highway at 6 APL-2
Nearest Pump Station/Response Base: SERVS/VMT	
Response Equipment On Site (Kits and major items): None	
Stream Bank Conditions at Site: Ground is generally flat with minimal banks and composed of gravel deposits with little bank and gravel bar access available at high water conditions. Minimal soil present	**Vegetation Conditions at Site:** Wide open areas upstream of site with heavy brush and shrubs across the highway
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport	**Utilize Additional Response Resources from:** SERVS/VMT
Communications Resources Available: VHF, ARTS, satellite phone	
Wildlife Sensitivities: Eagle, bear	

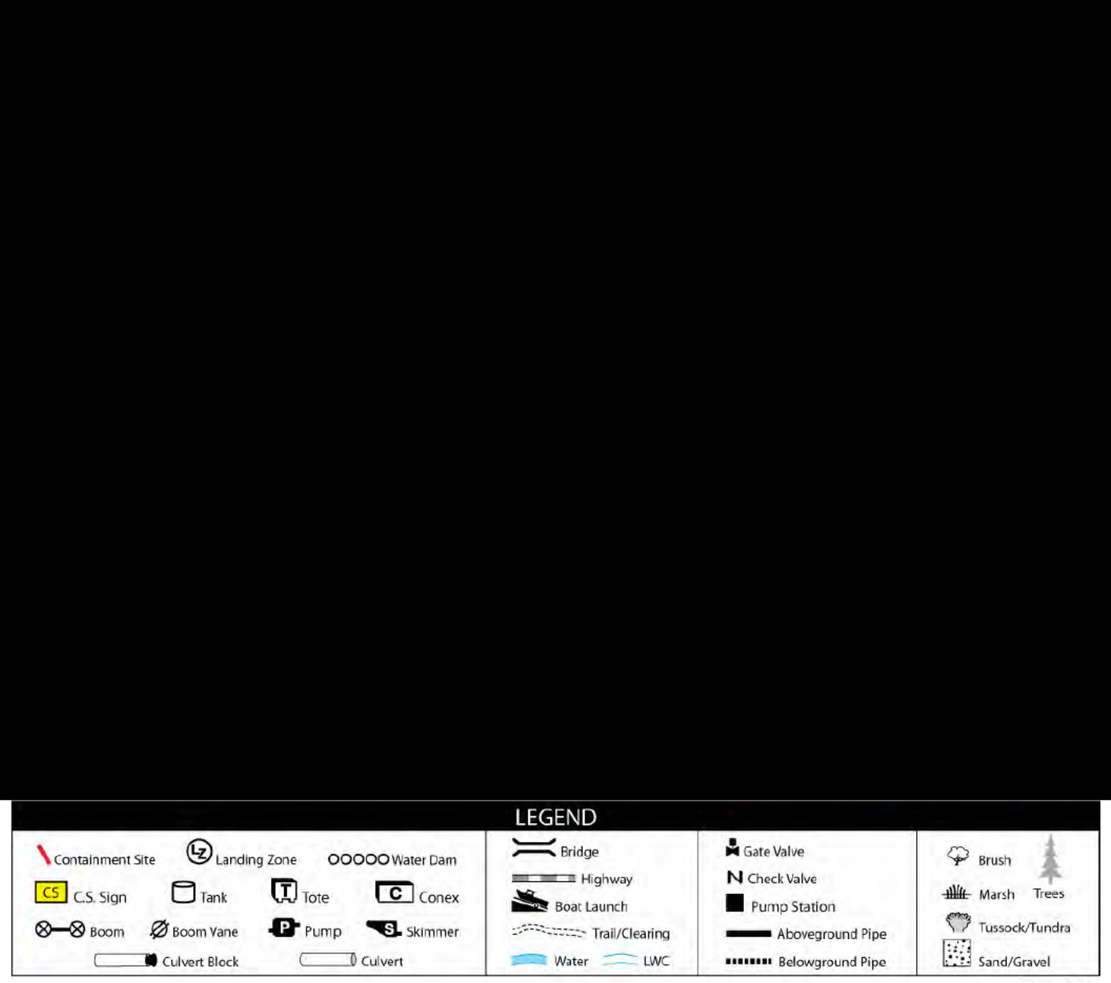
IV. General Site Description

Site is located at the west side of the creek crossing.
Creek can be heavily braided and channeled in areas, and so a combination of tactics may be necessary.
Good access on the north bank, upstream of the culvert crossing to deploy additional containment sites.

River Data	Staging Areas	Base Map Containment Sites	CS 12-6 Abercrombie Creek
• Width = 10 - 20 ft. Braided Channels • Velocity = 2 - 5 ft./sec.	• VMT/SERVS • Petro Star	CS 12-6 CS 12-7 CS 12-8	C-Plan Map Ref. 72 Aerial Map Ref. 410 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



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Abercrombie Creek — CS 12-6

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Boat from Lowe River

II. Response Objectives and Data

Strategic Response Objective(s):

Ensure responder safety through use of site-specific safety procedures.

Establish containment at sites where oil recovery, storage and transport can be optimized.

Minimize additional impacts to the environment

Tactical Response Objective(s):

Establish underflow dams at available locations and channels.

Establish diversion and containment operations at sites downstream of the highway crossing and creek/river confluence.

Establish recovery operations along the creek bank at selected locations below the pipe crossing.

Establish containment booming operations at sites of opportunity near the containment site.

Deploy deflection boom to divert oil to containment and recovery areas.

Summer Response Tactic(s):	Winter Response Tactic(s):
Underflow dam and berm if water conditions allow	Possible ice augering at selected locations
Diversion and containment booming below highway bridge	Underflow dam and berming if water conditions allow
Containment booming at sites above the bridge and below the pipe	Diversion and containment booming below highway bridge

Additional Containment Sites Above this Location:	Additional Containment Sites Below this Location:
None	None

III. General Site Information

Water Path:	Water Variations:
Abercrombie Creek enters a side channel of the Lowe River just below this site.	The creek is susceptible to seasonal flooding and rain influences upstream of the pipe.
LZ Location: Gravel pit on the south bank of the creek near the 796 access road	**Forward Staging Area:** Gravel pit on the south bank of the creek near the 796 access road

Nearest Pump Station/Response Base:
SERVS/VMT

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Bank conditions vary according to location with some steep bank areas above the confluence. Low water conditions may allow for gravel banks to show up.	Coastal forest Heavy brush and shrub vegetation with some trees in areas
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport 5 miles	**Utilize Additional Response Resources from:** SERVS/VMT

Communications Resources Available:
Cell phone, VHF, ARTS

Wildlife Sensitivities: Black bear, eagle, and waterfowl

IV. General Site Description

Site is located on the south bank of Abercrombie Creek at the confluence of the Lowe River.

Refinery is located just south of the location and may allow for additional access to site from that side.

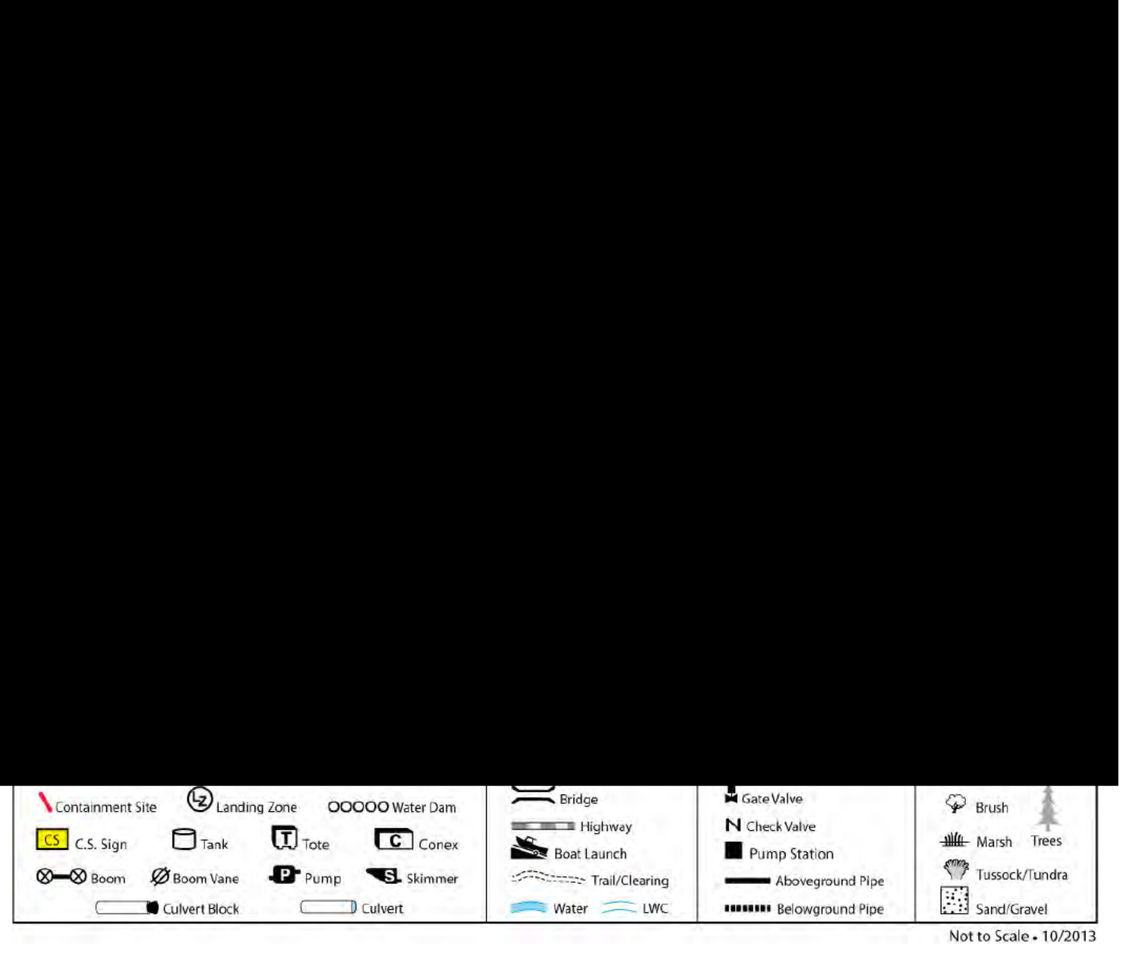
Numerous areas of opportunity are located along bank from the pipeline crossing to Dayville Road.

Low water levels may allow for access up and down the stream via stream bank.

River Data	Staging Areas	Base Map Containment Sites	CS 12-7 Lowe River
• Width = 40 - 100 ft. Braided Channels • Velocity = 2 - 8 ft./sec.	(b) (7)(F), (b) (3)	CS 12-6 CS 12-7 CS 12-8	C-Plan Map Ref. 70 Aerial Map Ref. 401, 402 (b) (7)(F), (b) (3) Contact APSC Land/Legal for permitted legal description of this site.

North

(b) (7)(F), (b) (3)



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Alyeska pipeline SERVICE COMPANY

Lowe River — CS 12-7

I. Site Location

(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from migrating off land if spill is near the river.
Ensure responder safety through use of site-specific safety procedures.
Establish containment at sites where oil recovery, storage and transport can be optimized.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Establish d kes and berms to contain oil on land if applicable.
Establish diversion and containment booming operations at sites along the river downstream of pipe crossing, at highway crossing and below.
Establish recovery operations at areas along the river bank below the pipe crossing.
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming operations in fast water Recovery operations at multiple sites	Diversion and containment booming operations in fast water as conditions allow Recovery operations at multiple sites as conditions allow Possible ice slotting in select locations
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** None

III. General Site Information

Water Path:	Water Variations:
The Lowe River flows into Keystone Canyon just below this site and enters Port Valdez several miles downstream.	The river is suscept ble to seasonal and rain influences. Current speed is consistently fast.
LZ Location: (b) (7)(F), (b) (3)	**Forward Staging Area:** (b) (7) ehicle turn out

Nearest Pump Station/Response Base:
SERVS/VMT 15 miles

Response Equipment On Site (Kits and major items):
None

Bank Conditions at Site:	Vegetation Conditions at Site:
River bank is largely gravel and rock with minimal soils present. Some areas may have steep bank but generally are sloped. Some areas have been supplemented with boulders to stabilize the bank.	Minimal vegetation due to soil Shrubs and brush present along certain areas of the bank
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport	**Utilize Additional Response Resources from:** SERVS/VMT

Communications Resources Available:
VHF, ARTS, satellite phone, cell phone

Wildlife Sensitivities: Fish, black bear, eagle, and waterfowl

IV. General Site Description

Site is located just downstream of the pipeline crossing of the river.

Depending on the time of year, high water levels may eliminate gravel bars.

River Data	Staging Areas	Base Map Containment Sites	CS 12-8 Brown's Creek
• Width = 40 - 100 ft. Braided Channels • Velocity = 2 - 8 ft./sec.	(b) (7)(F), (b) (3)	CS 12-6 CS 12-7 **CS 12-8**	C-Plan Map Ref. 71 Aerial Map Ref. 404 (b) (7)(F), (b) (3) legal description of this site.

North

(b) (7)(F), (b) (3)

LEGEND

Containment Site | Landing Zone | Water Dam | Bridge | Gate Valve | Brush
C.S. Sign | Tank | Tote | Conex | Highway | Check Valve | Marsh | Trees
Boom | Boom Vane | Pump | Skimmer | Boat Launch | Pump Station | Tussock/Tundra
Culvert Block | Culvert | Trail/Clearing | Aboveground Pipe | Sand/Gravel
Water | LWC | Belowground Pipe

Not to Scale

Alyeska pipeline SERVICE COMPANY

Brown's Creek CS 12-8

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Helicopter

II. Response Objectives and Data

Strategic Response Objective(s):
Prevent oil from moving past site and entering the Lowe River.
Ensure responder safety through use of site-specific safety procedures.
Identify areas of opportunity to establish containment and recovery sites.
Minimize additional impacts to the environment.

Tactical Response Objective(s):
Conduct Hazard Assessment and Site Safety Briefing prior to beginning work.
Establish deflection and containment boom site(s) at areas of opportunity along the river bank.
Deploy water dam system to develop recovery areas for skimmer systems.
Deploy recovery and transfer systems at associated containment sites.

Summer Response Tactic(s):	Winter Response Tactic(s)
Diversion and containment booming operations in fast water Evaluate trench and diversionary dikes in certain locations Recovery operations at multiple sites	Evaluate use of snow and other berms Deflection and containment booming where available
Additional Containment Sites Above this Location: None	**Additional Containment Sites Below this Location:** Areas of opportunity on the Lowe River

III. General Site Information

Water Path:	Water Variations:
Brown's Creek collects runoff from the mountains and associated streams and flows into the Lowe River just below this site.	Water speed is typically fast in all conditions. Rains and melt off will change water elevation significantly and quickly.
LZ Location: Possible gravel bars downstream of site 4 APL-1A vehicle pullout	**Forward Staging Area:** 4 APL-1A vehicle pullout at Richardson Highway Richardson Highway public vehicle pull out

Nearest Pump Station/Response Base:
SERVS/VMT

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
Stream bank is largely gravel and rock with minimal sand or soils. Banks may be steep in certain areas along creek sides with some areas having gradual slopes.	Coastal forest Heavy undergrowth in woods with large trees behind the site
Location of Nearest Initial Helicopter Refueling Point: Valdez Airport 10 miles	**Utilize Additional Response Resources from:** SERVS/VMT

Communications Resources Available:
VHF, ARTS, satellite phone

Wildlife Sensitivities: Black bear, eagle, waterfowl

IV. General Site Description

Site is just below the pipeline crossing of Brown's Creek and at the confluence with the Lower River.

Site can be accessed from the Lowe River in certain water conditions.

A primary channel appears to be developing on the south side of the creek in normal water conditions.

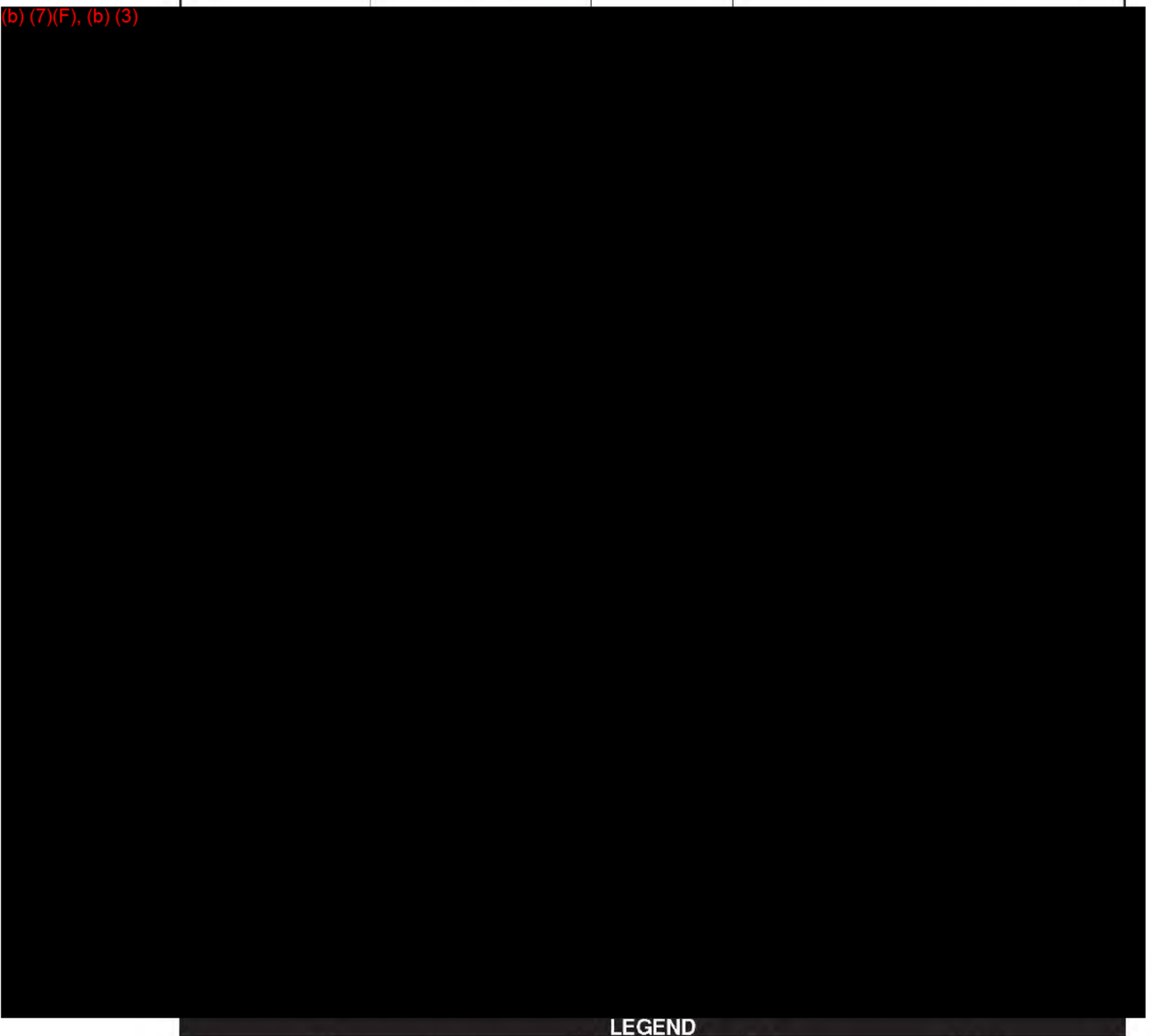
Bank conditions may be hazardous at high flow due to undermining of the bank

Areas of Opportunity

Gulkana River Site A
Gulkana River Site B
Gulkana River Site C
Gulkana River Site D

River Data	Staging Areas	Base Map Sites	Site A Gulkana River
• Width = 50 ft. - 150 ft. • Velocity = 2 - 6 ft./sec.	• Sourdough Campground • RGV-100 Conex • Glennallen Response Base	Site A Site C Site B Site D	USGS Ref. Gulkana B-3 Alyeska Aerial Ref. 186 (off corridor) (b) (7)(F), (b) (3)

North



LEGEND

Containment Site | Landing Zone | Underflow Dam | C.S. Sign | Tank | Tote | Conex | Boom | Boom Vane | Pump | Skimmer | Culvert Block | Culvert

Trail | Water | Bridge | Highway | Boat Launch

Gate Valve | Check Valve | Pump Station | Aboveground Pipe | Belowground Pipe

Sand/Gravel | Brush | Marsh | Tussock | Trees

Not to Scale

Alyeska pipeline

Gulkana River Site A

I. Site Location

Location Description:	Nearest Highway MP:	GPS Coordinates:
(b) (7)(F), (b) (3)	N/A (b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)

Primary Access:	Secondary Access:
Helo from Glennallen Response Base or RGV 100	Boat from Sourdough Campground (upstream) or Saylors Pit (downstream)

II. Response Objectives and Data

Strategic Response Objective(s):
Maximize recovery opportunities by deflecting oil to areas of opportunity at or near Site A to increase containment and recovery efficiency.
Prevent oil from moving past the containment site(s) through establishment of containment booms, recovery systems and oil storage/transport procedures.

Tactical Response Objective(s):
Establish deflection boom(s) using the Boom Vane and/or traditional anchor systems as needed to deflect oil to containment booms and recovery areas.
Establish containment boom(s) at sites where oil recovery and storage can be optimized.
Establish recovery and storage systems at each containment site to recover contained oil.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming at pre-identified areas and sites of opportunity along the river based on river conditions, oil movement, and response needs	Deflection and containment booming in open areas and channels as available based on river conditions, oil movement, and response needs

Additional Containment Sites Affected Above this Location:	Additional Containment Sites Below this Location:
CS 10-17 Sourdough Campground Additional sites of opportunity at gravel bars and stream banks depending on water conditions	CS 10-16 Richardson Highway crossing of the Gulkana River Gulkana Sites B, C, and D Additional sites of opportunity at gravel bars and stream banks depending on water conditions.

III. General Site Information

Water Path:	Water Variations:
Water flows from the east and west forks of the Gu kana River and miscellaneous small streams through the Gulkana River to the Copper River confluence approximately 36 river miles from this site.	Seasonal and weather-related impacts can cause changes in river conditions. Dry seasonal conditions may expose numerous bars and shallow areas. Spring meltoff and rains may reduce or cover some bars.
LZ Location: LZ is located on the point of land comprising the primary site. Each of the other two sites has a variable LZ depending on river conditions, winds, and response needs.	**Forward Staging Area:** RGV 100 is the initial staging area for Site A response equipment. Secondary staging support may come from the Glennallen Response Base, RGV 102, or Sourdough Campground.

Nearest Pump Station/Response Base:
Glennallen Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
The primary site is on the end of a spit of land with a gradual slope of gravel and sand to the river. The site is on the downstream side of the spit but the full bend is accessible at normal water levels. Secondary sites are long gravel bars with similar slope.	Open gravel bars with increasing density of brush away from rivers edge. Trees are above the high-water flood line. Occasional paths are present through brush from public use.
Location of Nearest Initial Helicopter Refueling Point: Gu kana Airport	**Utilize Additional Response Resources from:** Glennallen Response Base, RGV 102, PS9-10

Communications Resources Available:
ARTS at select locations, satellite phone, cell phone at select locations, VHF local

Wildlife Sensitivities: fish, moose, bears, waterfowl, eagles

IV. General Site Description

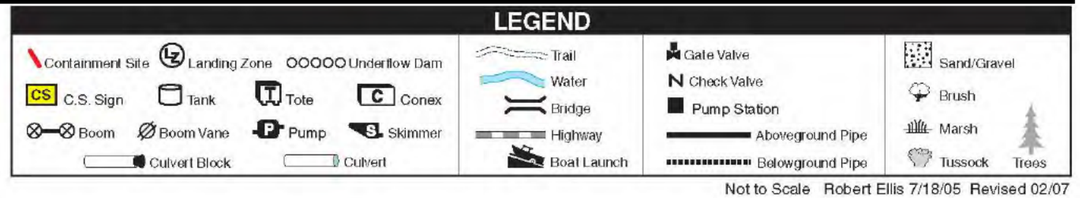
The area is comprised of three potential sites. The upstream site is at the end of a long, relatively straight run on the river, the second on the inboard side of a 180° bend across from the first, and the third is downstream on a gradual bend on the same side as the second. There is potential for a fourth site on the opposite bank and in between the second and third sites at low water.

The upper and lower sites will create a narrow river channel at low water. Consideration should be given to equipment placement at these sites as rising water levels will make the bars fairly narrow.

Roundtrip flight time between RGV 100 and the site is under 5 minutes.

River Data	Staging Areas	Base Map Sites	Site B Gulkana River
• Width = 50 ft. - 150 ft. • Velocity = 2 - 6 ft./sec.	• Highway Pullout at Site B • Sourdough Campground • Glennallen Response Base • RGV-100 Conex	Site A Site C Site B Site D	USGS Ref. Gulkana B-3 Alyeska Aerial Ref. 187 (off corridor) (b) (7)(F), (b) (3) North

(b) (7)(F), (b) (3)



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Alyeska pipeline

Gulkana River Site B

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Boat from Sourdough Campground (upstream) or Saylors Pit (downstream)

II. Response Objectives and Data

Strategic Response Objective(s):
Maximize recovery opportunities by deflecting oil to areas of opportunity at Site B to increase containment and recovery efficiency.
Prevent oil from moving past the containment site through establishment of containment booms, recovery systems, and oil storage/transport procedures.

Tactical Response Objective(s):
Establish deflection booms using the Boom Vane and/or traditional anchor systems as needed to deflect oil to containment booms and recovery areas.
Establish containment boom at site where oil recovery and storage can be optimized.
Establish recovery and storage systems at containment site to recover contained oil.

Summer Response Tactic(s):	Winter Response Tactic(s)
Deflection and containment booming at pre-identified areas and sites of opportunity along the river based on river conditions, oil movement, and response needs	Deflection and containment booming in open areas and channels as available based on river conditions, oil movement, and response needs
Additional Containment Sites Affected Above this Location: CS 10-17 Sourdough Campground Gu kana Site A Additional sites of opportunity at gravel bars and stream banks depending on water conditions	**Additional Containment Sites Below this Location:** CS 10-16 Richardson Highway crossing of the Gu kana River Gu kana Sites C and D Additional sites of opportunity at gravel bars and stream banks depending on water conditions

III. General Site Information

Water Path:	Water Variations:
The east and west forks of the Gulkana River and various small drainage creeks flow into the Gu kana River. The Copper River confluence is approximately 32 river miles downstream.	Seasonal and weather-related impacts can cause changes in river conditions. Dry seasonal conditions may expose numerous bars and shallow areas. Spring meltoff and rains may reduce or cover some bars.
LZ Location: The primary LZ is located on the gravel point that faces east towards the highway. The secondary LZ site could be created away from shoreline in low vegetation area after grooming.	**Forward Staging Area:** RGV 100 is the initial staging area for Site B response equipment. Secondary staging support may come from the Glennallen Response Base, RGV 102, or Sourdough Campground.

Nearest Pump Station/Response Base:
Glennallen Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:	Vegetation Conditions at Site:
The site has gradual gravel bars with stable soils. The site is located on a fairly sweeping 180° bend so currents tend to be slow along the bar. The site remains open at all river stages except flood levels.	Heavy brush and vegetation exist along the stream bank at high-water mark and upper reaches of gravel bar. Moderate-size trees are present along the edge of the river bank. The site has a few small trails to woods from public use.
Location of Nearest Initial Helicopter Refueling Point: Gu kana Airport	**Utilize Additional Response Resources from:** RGV 102 conex, PS9-10, Glennallen Response Base

Communications Resources Available:
ARTS and cell phone at select locations, satellite phone, VHF local

Wildlife Sensitivities: fish, bear, moose, waterfowl, eagle

IV. General Site Description

The area is comprised of a wide 180° bend in the river with the site on the inside of the bend. The upstream approach to this site is a hard bend to the left. Deflection and containment booms at both the leading and trailing edges of the point should help to maximize recovery. The bare vegetation goes back approximately 100 feet to the tree line.

There are two large highway pullouts immediately above the site that will support secondary staging area operations. One site is part of the old highway route and still usable, the other is an active turnout. Both are on the river (west) side of the highway.

There is a potential for development of a portable pipeline from the site, across the river and up the bank to the pullout for long-term oil transfer.

Roundtrip flight time between RGV 100 and the site is under 7 minutes.

River Data	Staging Areas	Base Map Sites	Site C Gulkana River
• Width = 50 ft. - 150 ft. • Velocity = 2 - 6 ft./sec.	• Gulkana River Campground • Saylors Pit • Glennallen Response Base • RGV 102	Site A Site C Site B Site D	USGS Ref. Gulkana B-3, B-4 Alyeska Aerial Ref. 188 (off corridor) (b) (7)(F), (b) (3) North

(b) (7)(F), (b) (3)



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Alyeska pipeline

Gulkana River Site C

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Boat from Sourdough Campground (upstream) or Saylors Pit (downstream)

II. Response Objectives and Data

Strategic Response Objective(s):
Maximize recovery opportunities by deflecting oil to areas of opportunity at or near Site C to increase containment and recovery efficiency. Prevent oil from moving past the containment site through establishment of containment booms, recovery systems, and oil storage/transport procedures.

Tactical Response Objective(s):
Establish deflection boom using the Boom Vane and/or traditional anchor systems as needed to deflect oil to containment booms and recovery areas.
Establish containment boom at site(s) where oil recovery and storage can be optimized.
Establish recovery and storage systems at containment site(s) to recover contained oil.

Summer Response Tactic(s):
Deflection and containment booming at pre-identified areas and sites of opportunity along the river based on river conditions, oil movement and response needs

Winter Response Tactic(s)
Deflection and containment booming in open areas and channels as available based on river conditions, oil movement and response needs

Additional Containment Sites Affected Above This Location:
CS 10-17 Sourdough Campground
Gu kana Sites A and B
Additional sites of opportunity at gravel bars and stream banks depending on water conditions

Additional Containment Sites Below This Location:
CS 10-16 Richardson Highway crossing of the Gulkana River
Gulkana Site D
Additional sites of opportunity at gravel bars and stream banks depending on water conditions

III. General Site Information

Water Path:
The east and west forks of the Gulkana River and various small drainage creeks flow into the Gu kana River. The Copper River confluence is approximately 28 river miles downstream.

Water Variations:
Seasonal and weather-related impacts can cause changes in river conditions. Dry seasonal conditions may expose numerous bars and shallow areas. Spring meltoff and rains may reduce or cover some bars.

LZ Location:
LZ is located on the point of land comprising the primary site. The upstream site has a variable LZ depending on river conditions, winds, and response needs.

Forward Staging Area:
RGV 102 is the initial staging area for Site C response equipment. Secondary staging support may come from the Glennallen Response Base, RGV 100, Sourdough Campground, or Saylors Pit Staging Area.

Nearest Pump Station/Response Base:
Glennallen Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Both sites have gradual gravel bars with stable soil. The upper site is long and narrow with an offshore gravel bar created at high water. The primary site is located on the inside bank of a tight 180° bend.

Vegetation Conditions at Site:
Heavy brush and vegetation exist along the stream bank at the high-water mark and upper reaches of the gravel bar. A small stand of trees are at back from the point. The site has a few small trails to woods from public use.

Location of Nearest Initial Helicopter Refueling Point:
Gu kana Airport

Utilize Additional Response Resources From:
RGV 100 conex, PS9-10, Glennallen Response Base

Communications Resources Available:
ARTS and cell phone at select locations, satellite phone, VHF local

Wildlife Sensitivities: fish, bear, moose, waterfowl

IV. General Site Description

The area is comprised of two sites. The primary site is a tight bend in the river with the site on the inside of the bend. There is approximately 100 feet of bare vegetation before reaching a tall stand of trees. The upstream approach to this site is a short, straight run with room to set up multiple deflection booms. A gravel bar will support more than one recovery site.

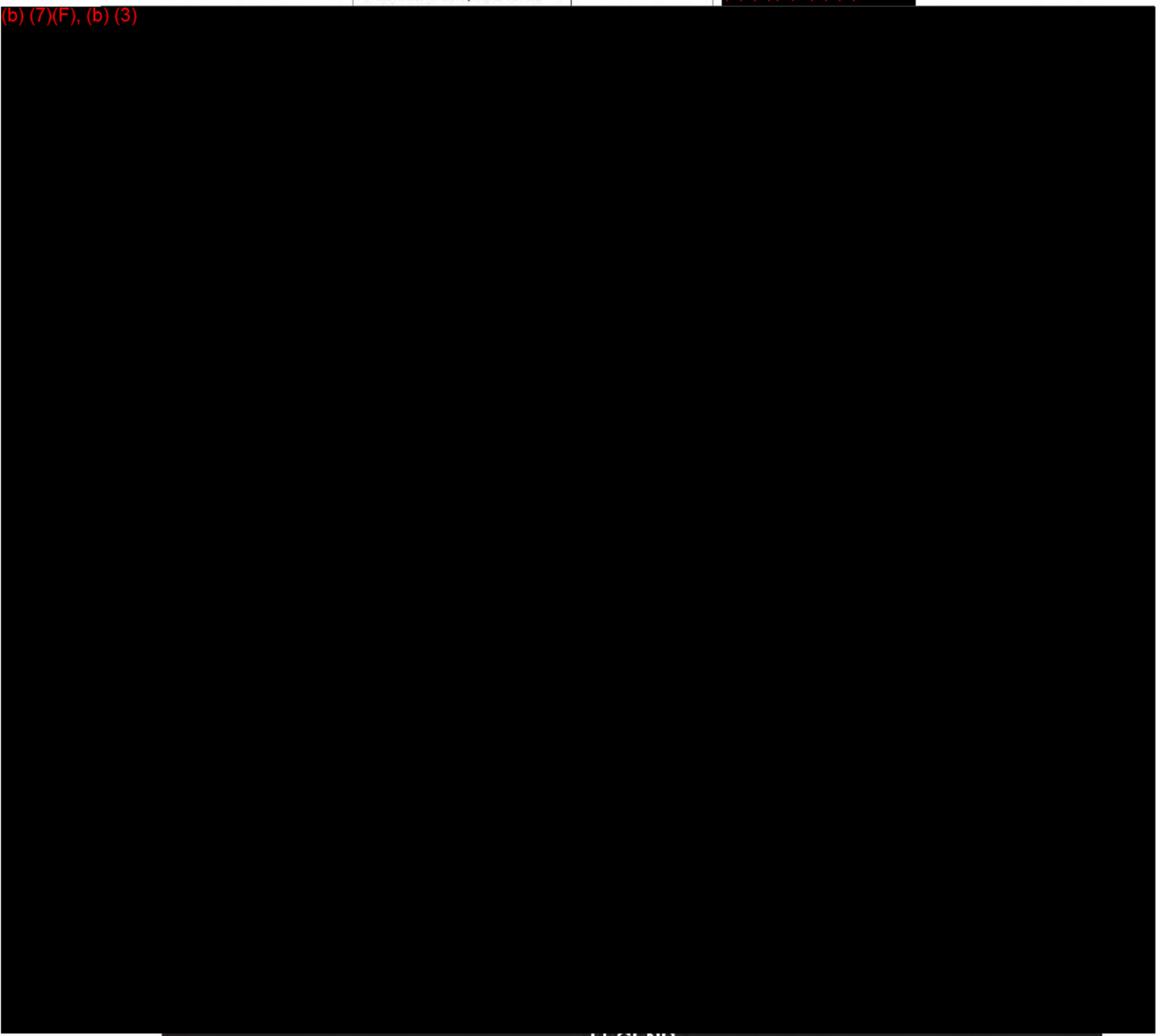
The second site is upstream and on the opposite bank. The site is on a more gradual bend and may create an offshore gravel bar at higher water levels as a shallow inside channel develops. At lower water levels, there is considerable area for equipment and a defined narrowing of the channel.

There is a long highway pullout immediately above the site that will support secondary staging area operations. The site is part of the old highway route and still usable.

Roundtrip flight time between RGV 102 and the site is under 15 minutes.

River Data	Staging Areas	Base Map Sites	Site D Gulkana River
• Width = 50 ft. - 150 ft. • Velocity = 2 - 6 ft./sec.	• Gulkana River Campground • Saylors Pit • Glennallen Response Base	Site A Site C Site B Site D	USGS Ref. Gulkana B-3, B-4 Alyeska Aerial Ref. 189 (off corridor) (b) (7)(F), (b) (3)

North



LEGEND

Containment Site · Landing Zone · Underflow Dam · C.S. Sign · Tank · Tote · Conex · Boom · Boom Vane · Pump · Skimmer · Culvert Block · Culvert

Trail · Water · Bridge · Highway · Boat Launch

Gate Valve · Check Valve · Pump Station · Aboveground Pipe · Belowground Pipe

Sand/Gravel · Brush · Marsh · Tussock · Trees

Not to Scale Robert Ellis 7/18/05 Revised 02/07

Alyeska pipeline

Gulkana River Site D

I. Site Location

(b) (7)(F), (b) (3)

GPS Coordinates:
(b) (7)(F), (b) (3)

(b) (7)(F), (b) (3)

Secondary Access:
Boat from Sourdough Campground (upstream) or Saylors Pit (downstream)

II. Response Objectives and Data

Strategic Response Objective(s):
Maximize recovery opportunities by deflecting oil to areas of opportunity at or near Site C to increase containment and recovery efficiency.
Prevent oil from moving past the containment site through establishment of containment booms, recovery systems, and oil storage/transport procedures.

Tactical Response Objective(s):
Establish deflection boom using the Boom Vane and/or traditional anchor systems as needed to deflect oil to containment booms and recovery areas.
Establish containment boom at site(s) where oil recovery and storage can be optimized.
Establish recovery and storage systems at containment site(s) to recover contained oil.

Summer Response Tactic(s):
Deflection and containment booming at pre-identified areas and sites of opportunity along the river based on river conditions, oil movement and response needs

Winter Response Tactic(s)
Deflection and containment booming in open areas and channels as available based on river conditions, oil movement and response needs

Additional Containment Sites Affected Above this Location:
CS 10-17 Sourdough Campground
Gu kana River Sites A, B, and C
Additional sites of opportunity at gravel bars and stream banks depending on water conditions

Additional Containment Sites Below this Location:
CS 10-16 Richardson Highway crossing of the Gulkana River
Additional sites of opportunity at gravel bars and stream banks depending on water conditions

III. General Site Information

Water Path:
The east and west forks of the Gulkana River and various small drainage creeks flow into the Gu kana River. The Copper River confluence is approximately 21 river miles downstream.

Water Variations:
Seasonal and weather-related impacts can cause changes in river conditions. Dry seasonal conditions may expose numerous bars and shallow areas. Spring meltoff and rains may reduce or cover some bars.

LZ Location:
LZ is located on the point of land comprising the primary site. The upstream site has a variable LZ depending on river conditions, winds, and response needs.

Forward Staging Area:
RGV 102 is the initial staging area for Site D response equipment. Secondary staging support may come from the Glennallen Response Base, RGV 100, Sourdough Campground, or Saylors Pit Staging Area.

Nearest Pump Station/Response Base:
Glennallen Response Base

Response Equipment On Site (Kits and major items):
None

Stream Bank Conditions at Site:
Both sites have gravel bars with stable soil. The primary site is long and narrow with more slope to the water. An offshore gravel bar may be created at high water. The lower site is located on the inside bank of a river bend and has a gradual slope and open area around the bend.

Vegetation Conditions at Site:
The primary site has an approximate 75-foot band of vegetation along stream bank. Moderate-size trees are present, with no open area away from the shoreline. The upper site has a wider gravel and vegetation buffer with heavy tree vegetation beyond the buffer.

Location of Nearest Initial Helicopter Refueling Point:
Gu kana Airport

Utilize Additional Response Resources from:
RGV 100 conex, PS9-10, Glennallen Response Base

Communications Resources Available:
ARTS and cell phone at select locations, satellite phone, VHF local

Wildlife Sensitivities: fish, bear, moose, waterfowl, eagle

IV. General Site Description

The area is comprised of two sites. The primary site is a moderate bend in the river with the site on the inside of the bend. The upstream approach to this site is a left turn with enough sweep to support deflection booming. The second site is downstream around a bend and on the opposite bank. This site is at the end of a short, straight stretch that would support long deflection booms.

There is a long and wide highway shoulder immediately above the site that will support secondary staging area operations. The site is part of the old highway route and still usable.

There is a potential for development of a portable pipeline from the site, across the river and up the bank to the pullout for long-term oil transfer.

Roundtrip flight time between RGV 102 and the site is under 10 minutes.

Section 6. Hydrology of Major Drainages

The table that follows contains hydrological information on the streams either crossed by or potentially affected by a pipeline spill. Data[1] are arranged by pipeline milepost and stream name. Use this table to supplement the spill assessment information in the Containment Instructions tables in Section 3.

[1] Michael Baker, Jr., Inc. 1972. *Drainage Basin Studies. Yukon River to Prudhoe.* Beaver, PA; Jackson, MS; Fairbanks, AK. November 1972.

Michael Baker, Jr., Inc. 1973. *Drainage Basin Studies. Valdez to Yukon River.* Beaver, PA; Jackson, MS; Fairbanks, AK. January 1973.

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
–	**Putuligayuk (Put) River**	The Put R flows in a meandering single channel that is incised within the tundra plain. During the summer, the flow is low, and there are gravel point bars at each meander. At, and downstream of, the road crossing, there has been considerable gravel mining, which has widened and deepened the channel. The construction of underflow dams or diversion booming into containment pits could be easily accomplished. During freezeup, the flow decreases rapidly and ceases by early winter. During breakup, flow in the river begins rapidly, filling the channel to the top of its banks within a few days. This peak flow will exist for 10 to 20 days before it will recede down to the normal low summer flow.	10 to 50 ft	50 to 300 ft	Summer	Low Flow	2-20	0-1	Underflow Dams, Diversion Booms
						Rain Floods	20-80	1-2	Diversion Berms, Sorbents
					Freezeup	Without Ice Cover	2-20	0-1	Underflow Dams, Diversion Berms
						With Ice Cover	0-5	0-1	Blocking Dams, Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	5-100	1-2	Diversion Booms
						After Ice Movement	100-2,500	1-3	
(b) (7)(F), (b) (3)	**Grayling Gulch**	Grayling Gulch is a tundra runoff channel that will only flow significantly (greater than 1 cfs) during breakup and rainfall runoff periods. The slope is gentle; hence, the velocities are slow. It flows into a couple of lakes immediately downstream from the pipeline crossing, and the mouth would offer a good booming location. During freezeup, flow will cease. During breakup, the entire channel will flow water, and some localized overbank flooding will occur.	10 to 40 ft	40 to 80 ft	Summer	Low Flow	0-5	0-1	Booms, Underflow Dams
						Rain Floods	5-15	0-1	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Sorbents
						With Ice Cover	0	0	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-15	0-1	Booms, Underflow Dams
						After Ice Movement	15-100	1-2	Sorbents
	Sagavanirktok (Sag) River Downstream of PS 2	The Sagavanirktok R flows in a braided pattern with several channels dividing and uniting, separated by gravel bars and islands. The channels will often change their courses rapidly during flood events; thus, the channel locations may be different than the way they appear on aerial photography. However, the general characteristics of the river will remain the same. The Sag R floodplain offers a plentiful supply of gravel materials that could be used during containment procedures. The floodplain gravels are highly permeable, and the containment pits, or gravel structures, should be lined to prevent oil from permeating the gravels. During the summer, flow will respond rapidly to rainstorms and Brooks Range snow melt; previous dry channels and gravel floodplains could be inundated. Where feasible, pipeline construction gravel pits, channel plugs, spur dikes, and access roads should be used as containment sites. Additional berming will also be required. The Sag R often develops water velocities greater than 3 fps in the major channels and most of the subchannels during the summer. Velocities will exceed 5 fps in the major subchannels during high flow periods, which precludes the ability of effectively operating containment procedures. Therefore, modification of the channels (using gravel floodplain material) by diverting subchannel flow and/or slowing velocities by widening and deepening the channel will probably be required to enable diversion booming of the oil to a containment pit. Since the pipeline parallels the Sag R, the oil will initially flow over the vegetated terraces, gravel floodplains, high water channels, or subsurface aquifers before entering the flowing water in the subchannels. Blocking these avenues of oil flow by berms, dams, or interceptor ditches may prevent the oil from entering flowing water. Damming or berming off the upstream side may prevent a rise in water level from flushing the oil into active channels. During freezeup, flow and velocities will progressively decrease as ice begins to form and flow in the channels. The small subchannels will freeze up and cease flow first. Flowing ice in the major channels can jam, backing water and ice upstream. Emphasis must be directed toward blocking subchannels to prevent oil from reaching flowing water. By early winter, continuous flow down the lower Sag R ceases. Between ice-covered pools, intra-gravel flow may exist. This flow steadily decreases, because it is forced to the surface and formed into aufeis fields, which commonly occur and may completely fill the river's channels with ice. During the early stages of breakup, the ice-filled channels cannot convey the water and will divert some of it to the side channels and vegetated floodplains. The water will eventually melt channels through the bedfast aufeis and break loose the river ice. The ice-bounded channels' dimensions will increase as breakup progresses. Due to the broad extent of flowing water, high velocities, and ice debris, containment of oil during breakup will be difficult. Efforts should be directed toward containing as much oil as possible on land or in the side channels.	Variable because of braiding	Variable because of braiding	Summer	Low Flow	2,000-8,000	1-3	Diversion Booms With Pits
						Rain Floods	8,000-28,000	2-4	Underflow Dams in Side Channels Blocking Dams in High Water Channels
					Freezeup	Without Ice Cover	150-2,000	1-2	Diversion Booms With Pits
						With Ice Cover	5-150	0.5-1	Underflow Dams, Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-2	0-1	Underflow Dams, Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	700-6,000	1-3	Diversion Booms With Pits
						After Ice Movement	6,000-17,000	2-4	Underflow Dams in Side Channels, Blocking Dams in High Water Channels

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
[redacted]	**Sagavanirktok (Sag) River Downstream of PS 2**	[redacted] Sag R divides into two main channels: the east channel and the west channel. These channels then separate and flow into the Beaufort Sea. The east channel flows into the western edge of Prudhoe Bay. At the mouth of the Sag R Delta, it is about 12 miles wide. Water velocities will progressively decrease as the river approaches the Beaufort Sea, thereby allowing more efficient booming operations. However, channel widths are much greater and may exceed 1,000 ft. During the summer, the prevalent wind directions along the coast are northeast and northwest, which are generally directed towards the mainland. During the winter, the coastline will freeze fast to the bottom where water depths are less than 4 ft. During breakup, the ice along the coastline does not significantly recede from the coast until mid-June.							
		At the pipeline crossing, this creek flows in a single incised channel. It joins a well-defined Sag R side channel 1,500 ft downstream from the pipeline. This creek drains the foothills tundra and has some lakes in its upper watershed; the water level will rise relatively slowly in response to rainstorm events. During freezeup, the flow will drop rapidly and cease by early winter. The water level will rise rapidly during the peak of breakup and could flood its banks.	20 to 40 ft	30 to 60 ft	Summer	Low Flow	20-150	1-3	Booms, Underflow Dams
						Rain Floods	150-400	2-5	Sorbents
					Freezeup	Without Ice Cover	2-20	1-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Sorbents
					Breakup	Before Ice Movement	20-200	1-3	Booms, Underflow Dams
						After Ice Movement	200-600	2-4	
	Lori Creek	This creek is a small foothill tundra stream that originates at Lori Lake located adjacent [redacted]. The creek flows in a beaded pattern with small ponds connected by narrow channels. During the summer, containment of oil in the beaded stream ponds could be easily accomplished. During freezeup, flow will decrease rapidly and cease by early winter. During breakup, the flow will increase rapidly and may flood its banks.	2 to 20 ft	5 to 30 ft	Summer	Low Flow	1-10	0-1	Booms, Underflow Dams
						Rain Floods	10-40	1-2	Sorbents
					Freezeup	Without Ice Cover	1-4	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Sorbents
					Breakup	Before Ice Movement	2-10	0-1	Booms, Underflow Dams
						After Ice Movement	10-100	1-2	Sorbents
	Oksrukuyik (Oks) Creek	Oks Crk drains the foothills west of the Sag R and parallels the pipeline until it joins the Sag R. At the upper pipeline crossing [redacted]) to about 1 mile downstream, the creek flows in a single incised pattern with a series of thermokarst ponds that would be ideal for containment by booming. Oks Crk then forms a meandering pattern within a narrow but well defined gravel floodplain that extends downstream to the lower pipeline crossing at [redacted]. There are two reaches that aufeis, near [redacted]. During the summer, the creek will have a high discharge during rainstorm events but will not normally flood its banks. During freezeup, the flow will decrease rapidly and cease by early winter. During the peak period of breakup, the discharge, velocities, and ice debris will make containment procedures very difficult, but this event should last for only 5 to 10 days.	20 to 60 ft	60 to 90 ft	Summer	Low Flow	10-100	1-4	Underflow Dams, Booms
						Rain Floods	100-400	3-8	Sorbents
					Freezeup	Without Ice Cover	2-30	1-2	Underflow Dams, Sorbents
						With Ice Cover	0-2	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	10-150	1-5	Underflow Dams, Booms
						After Ice Movement	150-500	4-9	Sorbents
	Becky Creek	The pipeline crosses and parallels this creek in its upper watershed. In the upper reaches and just before it enters the Kuparuk R, there are some pools in this system. The pools are ideal locations for booming operations. This creek ceases flow by early winter. During breakup, the pools will initially be ice filled and the flow will flood the channel banks.	2 to 10 ft	5 to 20 ft	Summer	Low Flow	1-15	0-2	Underflow Dams, Sorbents
						Rain Floods	15-40	1-2	Booms
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-60	1-3	Booms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
[redacted]	**Toolik River**	The pipeline crosses the Toolik R in its upper watershed. The stream flows in a beaded pattern, which is a small incised channel connecting a series of deep thermokarst pools. The channel typically is narrow, but the pools can be up to 40 ft wide and 15 ft deep. The pools are ideal locations for booming operations. In the lower portion of this system in the area of CS3-6, the river changes to a braided pattern where diversion booms should be effective. The stream ceases flow by early winter. During breakup, the pools will be ice filled, and the flow will flood the channel's banks.	2 to 40 ft	10 to 50 ft	Summer	Low Flow	2-20	0-2	Underflow Dams, Booms
						Rain Floods	20-50	1-2	Sorbents, Diversion Boom
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	2-20	0-2	Underflow Dams, Booms
						After Ice Movement	20-80	1-3	Sorbents, Diversion Booms
	East Fork Kuparuk River	The pipeline crosses this creek in its upper watershed. The stream flows in a beaded pattern, which is a small incised channel connecting a series of deep thermokarst pools. The channel typically is narrow, but the pools can be up to 40 ft wide and 15 ft deep. The pools (CS3-11) are ideal locations for booming operations. The stream ceases flow by early winter. During breakup, the pools will be ice filled and the flow will flood the channel's banks.	2 to 40 ft	10 to 50 ft	Summer	Low Flow	2-20	0-2	Underflow Dams, Booms
						Rain Floods	20-50	1-3	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	2-20	0-3	Underflow Dams, Booms
						After Ice Movement	20-80	1-3	Sorbents
	Kuparuk River	The Kuparuk R has a single incised channel that flows in a meandering pattern. The river flows beneath the Dalton Hwy, 1,500 ft downstream from the pipeline crossing (CS3 15). During low flow, there are several gravel bars that offer materials for containment actions. Rain floods will normally not exceed the channel's banks. During freezeup, flow decreases rapidly and will cease by early winter. Due to the high flow, velocities, and ice, complete containment during breakup will be difficult.	25 to 50 ft	50 to 100 ft	Summer	Low Flow	20-200	1-2	Underflow Dams, Booms
						Rain Floods	200-500	2-4	Sorbents
					Freezeup	Without Ice Cover	5-40	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-15	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-150	1-2	Underflow Dams, Booms
						After Ice Movement	150-800	2-5	Sorbents
	Atigun River (Lower Reach)	The Lower Atigun R is considered to be that reach between [redacted] Throughout this reach, the river has a distinct incised meandering pattern. The channels are split during low flow periods, and several gravel bars are exposed. The water level in the river will respond rapidly to rainstorms with sudden fluctuations in discharge. During Summer high flows, the channels fill to near bank full capacity. Throughout this reach, the river flows with relatively slow velocities until it passes the pipeline crossing and enters the Atigun Gorge, where the river flows at high velocities and prohibits containment of oil. Efforts must be directed towards containing oil before it enters the gorge. During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Flow will cease by early winter except for small seepages that surface and form the aufeis fields. Flow will increase rapidly during breakup and normally will overflow the banks onto the floodplain. The high discharge and velocities will make complete containment difficult. Efforts should be directed towards keeping as much oil as possible from leaving the ground surface.	100 to 200 ft	200 to 500 ft	Summer	Low Flow	200-600	1-2	Diversion Boom
						Rain Floods	600-1,500	2-5	
					Freezeup	Without Ice Cover	50-200	1-2	Diversion Boom, Underflow Dams
						With Ice Cover	0-50	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	100-400	1-2	Diversion Boom
						After Ice Movement	400-2,000	2-4	
	Atigun River (Mid-Reach)	The mid-reach of the Atigun R is considered to be that reach [redacted] 0, where the pipeline is aboveground. Throughout this reach, the river flows in a braided pattern with several channels dividing and uniting, separated by gravel bars and islands. This steep gradient river develops velocities greater than 3 fps in most channels throughout the Summer. Often velocities will exceed 5 fps, which precludes effectively operating containment procedures. Modification of the channels will be required (using gravel floodplain material) to enable diversion booming of the oil to a containment pit by diverting subchannel flow and/or slowing velocities by widening and deepening the channel. Containment procedures should trap the oil in the side channels or containment pits and keep the oil out of the major channels. The gravel materials may require lining to prevent the oil from permeating the gravel material.	50 to 140 ft	100 to 400 ft	Summer	Low Flow	150-500	1-3	Diversion Booms with Pits
						Rain Floods	500-1,200	2-4	Underflow Dams in Side Channels
					Freezeup	Without Ice Cover	40-150	1-2	Diversion Boom with Pits
						With Ice Cover	0-40	0-1	Underflow Dams, Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	50-300	1-3	Diversion Boom with Pits

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
		During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Continuous flow will cease by early winter. Intragravel flow will eventually be forced to the surface and build large aufeis fields. Aufeis can extend across the gravel floodplain and fill all the channels completely with ice. During breakup, the ice-choked channels can divert the flow of water onto the vegetated terraces until the water can eat a channel through the ice. During peak flows, the broad extent of water flowing at high discharges and velocities will make complete containment of oil difficult once it reaches the river. Since the pipeline is elevated on the terrace level, emphasis should be placed on containing as much oil as possible before it reaches the river.				After Ice Movement	300-1,800		Underflow Dams in Side Channels
(b) (7)(F), (b) (3)	**Atigun River (Upper Reach)**	The upper reach of the Atigun R is considered to be that reach (b) (7)(F), (b) (3) [redacted]. The pipeline is buried in the river's active floodplain throughout this reach. An oil spill will initially flow through the riverbed gravels for some distance before surfacing. Trenching in the riverbed gravels would be required to intercept the subsurface flow of oil. The Atigun R flows in a braided pattern with several channels dividing and uniting, separated by gravel bars. This steep gradient river will develop velocities greater than 3 fps in most channels throughout the Summer. During high flow periods, velocities could exceed 5 fps. Channel modifications will be required to divert water away from trenching operations. If oil reaches flowing water, channel modifications will be required to divert subchannel flow and/or slow velocities by widening and deepening channels to enable diversion booming of the oil to a containment pit. The permeable gravel materials may require lining to prevent the oil from re-entering the gravel. During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Continuous flow will cease by early winter. Intragravel flow will eventually be forced to the surface and build large aufeis fields. Aufeis can extend across the gravel floodplain and fill all the channels completely with ice. In some areas, aufeis could build over the buried pipe upstream of an aufeis area. It could enter the intra-gravel flow of water that leads to aufeis development; therefore, the oil would surface with the water. Containment could be carried out by trenching the area just upstream of where it is surfacing and intercepting the flow of oil. During breakup, the ice-choked channels can divert the flow of water onto the vegetated terraces until the water can eat a channel through the ice. During peak flows, the broad extent of water flowing at high discharges and velocities will make a complete containment of oil difficult once it reaches the river.	40 to 80 ft	80 to 200 ft	Summer	Low Flow	50-300	1-3	Trenches, Diversion Boom with Pits
						Rain Floods	300-900	2-6	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	10-80	1-2	Trenches, Underflow Dams
						With Ice Cover	0-10	0-1	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Trenches, Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	50-200	1-3	Trenches, Diversion Booms with Pits
						After Ice Movement	200-1,200	2-6	Sorbents Along Side Channels
	West Fork of the North Fork Chandalar River	The pipeline parallels this river for about 5 miles. The pipeline is buried in the river's active floodplain, except for that reach between (b) (7)(F), (b) (3) [redacted] where the pipeline is aboveground and on the vegetated terrace. Where the pipeline is buried, an oil spill will initially flow through the riverbed gravels for some distance before surfacing. Trenching may be required to intercept the subsurface flow of oil. The river flows in a braided pattern with several channels dividing and uniting, separated by gravel bars. This steep gradient river will develop velocities greater than 3 fps in most channels throughout the Summer. During high flow periods, velocities could exceed 5 fps, which precludes effectively operating containment procedures. Channel modifications may be required to divert water away from trenching operations. If oil reaches flowing water, channel modifications may be required to divert subchannel flow and/or slow velocities by widening and deepening channels in order to enable diversion booming of the oil to a containment pit. The permeable gravel materials will require lining to prevent the oil from re-entering the gravel. During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Continuous flow will cease by early winter. Intra-gravel flow will eventually be forced to the surface and build large aufeis fields. Aufeis can extend across the gravel floodplain and fill all the channels completely with ice. In some areas, aufeis could build over the buried pipeline, preventing local visual observation of the oil leak location. If a leak occurs in the buried pipe upstream of an aufeis area, it could enter the intra-gravel flow of water that leads to aufeis development; therefore, the oil would surface with the water. Containment could be carried out by trenching the area just upstream of where it is surfacing and intercepting the flow of oil. During breakup, the ice-choked channels can divert the flow of water onto the vegetated terraces until the water erodes a channel through the ice. During peak flows, the broad extent of water flowing at high discharges and velocities will make a complete containment of oil difficult once it reaches the river.	30 to 60 ft	40 to 200 ft	Summer	Low Flow	50-300	1-3	Trenches, Diversion Booms with Pits
						Rain Floods	300-900	2-4	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	10-80	1-2	Trenches, Underflow Dams
						With Ice Cover	0-10	0-1	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Trenches, Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	50-200	1-3	Trenches, Diversion Booms with Pits
						After Ice Movement	200-1,200	2-4	Sorbents Along Side Channels

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Dietrich River (Upper Reach)**	The Upper Reach of the Dietrich R is considered to be between the Chandalar Shelf and Nutirwik (b) (7)(F), (b) (3)). The Dietrich R begins in a mountainous gorge, with the channel confined to a single channel by valley walls. A few reaches braid out into multiple channels. The pipeline is buried through most of this reach, particularly where it is located within the river channel or active floodplain of the Dietrich R. It is elevated on the upper well-vegetated terrace levels. An oil spill in the buried portion will initially flow through the riverbed gravels for some distance before surfacing. Trenching in the gravels may be required to intercept the subsurface flow of oil. This steep gradient river will develop velocities greater than 3 fps in most channels throughout the Summer. During high flow periods, velocities could exceed 5 fps, which precludes effectively operating containment procedures. Channel modifications may be required to divert water away from trenching operations. If oil reaches flowing water, channel modifications may be required to divert subchannel flow and/or slow velocities by widening and deepening channels in order to enable diversion booming of the oil to a containment pit. The permeable gravel materials will require lining to prevent the oil from re-entering the gravel. During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Intra-gravel flow will eventually be forced to the surface and build large aufeis fields. Aufeis can extend across the gravel floodplain and fill all the channels completely with ice. In some areas aufeis could build over the buried pipeline preventing local visual observation of the oil leak location. If a leak occurs in the buried pipe upstream of an aufeis area, it could enter the intra-gravel flow of water that leads to aufeis development; therefore, the oil would surface with the water. Containment could be carried out by trenching the area just upstream of where it is surfacing and intercepting the flow of oil. During breakup, the ice-choked channels can divert the flow of water onto the vegetated terraces until the water erodes a channel through the ice. During peak flows, the broad extent of water flowing at high discharges and velocities, coupled with debris and ice, will make complete containment of oil difficult once it reaches the river.	30 to 60 ft	40 to 200 ft	Summer	Low Flow	100-500	1-4	Trenches, Diversion Booms with Pits
						Rain Floods	500-1,000	2-7	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	40-150	1-2	Trenches, Underflow Dams
						With Ice Cover	5-40	0-1	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-2	0-1	Trenches, Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	50-300	1-3	Trenches, Diversion Booms with Pits
						After Ice Movement	300-1,200	2-7	Sorbents Along Side Channels
	Dietrich River (Mid-Reach)	The Mid-Reach of the Dietrich R is considered to be between Nutirwik Crk and AR 105-APL-3 (b) (7)(F), (b) (3) The pipeline is buried in or adjacent to the Dietrich R's active floodplain throughout this reach, except between (b) (7)(F), (b) (3) , where it is elevated on the terrace level. An oil spill will initially flow through the gravel materials for some distance before surfacing. Trenching in the riverbed or floodplain gravels may be required to intercept the subsurface flow of oil. The Dietrich R flows in a braided pattern with several channels dividing and uniting, separated by gravel bars. This steep gradient river will develop velocities greater than 3 fps in most channels throughout the Summer. During high flow periods, velocities could exceed 5 fps, which precludes effectively operating containment procedures. Channel modifications may be required to divert water away from trenching operations. If oil reaches flowing water, channel modifications may be required to divert subchannel flow and/or slow velocities by widening and deepening channels to enable diversion booming of the oil to a containment pit. The permeable gravel materials will require lining to prevent the oil from re-entering the gravel. Since the pipeline parallels the east bank of the Dietrich R, the oil will initially flow on the east floodplain and into the east subchannels. Containment procedures should keep the oil out of the central major channels. During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Intra-gravel flow will eventually be forced to the surface and build large aufeis fields. Aufeis can extend across the gravel floodplain and fill all the channels completely with ice. In some areas aufeis could build over the buried pipeline, preventing local visual observation of the oil leak location. If a leak occurs in the buried pipe upstream of an aufeis area, it could enter the intra-gravel flow of water that leads to aufeis development; therefore, the oil would surface with the water. Containment could be carried out by trenching the area just upstream of where it is surfacing and intercepting the flow of oil. During breakup, the ice-choked channels can divert the flow of water onto the vegetated terraces until the water can erode a channel through the ice. During peak flows, the broad extent of water flowing at high discharges and velocities, coupled with debris and ice, will make complete containment of oil difficult once it reaches the river.	40 to 150 ft	100 to 400 ft	Summer	Low Flow	400-1,200	1-4	Trenches, Diversion Booms with Pits
						Rain Floods	1,200-3,000	2-4	Underflow Dams in Side Channels, Sorbents
					Freezeup	Without Ice Cover	50-300	1-3	Trenches, Underflow Dams
						With Ice Cover	10-50	1-2	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-5	0-1	Trenches, Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	300-600	1-4	Trenches, Diversion Booms with Pits
						After Ice Movement	600-3,000	2-4	Sorbents Along Side Channels, Underflow Dams in Side Channels

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Dietrich River (Lower-Reach)**	The Lower Reach of the Dietrich R is considered to be between (b) (7)(F), (b) (3) , at the confluence of the Dietrich and Bettles R. The pipeline is aboveground and located on the terrace level throughout this reach, except between (b) (7)(F), (b) (3) , where it is buried in the active floodplain. A spill in this reach will have to flow over the vegetated terrace before entering the Dietrich R or its tr butaries. Emphasis should be placed on containing the oil on the vegetated terrace or on the active gravel floodplain adjacent to the terrace level before it enters the Dietrich R. Throughout most of this reach, the Dietrich R flows in a braided pattern with several channels dividing and uniting. At several locations along the valley bottom, tributaries have built alluvial fans confining the Dietrich to a narrower split channel pattern. This steep gradient river will develop velocities greater than 3 fps in most channels throughout the Summer. Often velocities will exceed 5 fps, which precludes effectively operating containment procedures. Modification of the channels may be required (using gravel floodplain material) by diverting subchannel flow and/or slowing velocities by widening and deepening the channel to enable diversion booming of the oil in the side channel or containment pits to keep the oil out of the major channels. The gravel materials will require lining to prevent the oil from permeating the gravel material. During freezeup, the flow will decrease rapidly. Ice will first begin to form over the slow velocity reaches that exist in the deeper pools. Intra-gravel flow will eventually be forced to the surface and build large aufeis fields. Aufeis can extend across the gravel floodplain and fill all the channels with ice. During breakup, the ice-choked channels can divert the flow of water onto the vegetated terraces until the water can erode a channel through the ice. During peak flows, the broad extent of water flowing at high discharges and velocities will make complete containment of oil difficult once it reaches the river. Since the pipeline is elevated on the terrace level, emphasis should be placed on containing as much oil as possible before it reaches the river.	50 to 150 ft	150 to 500 ft	Summer	Low Flow	400-1,500	1-4	Diversion Booms with Pits
						Rain Floods	1,500-4,000	2-4	Underflow Dams in Side Channels, Sorbents
					Freezeup	Without Ice Cover	50-400	1-3	Diversion Booms with Pits
						With Ice Cover	10-80	1-2	Underflow Dams, Sorbents. Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	400-800	1-4	Diversion Booms with Pits
						After Ice Movement	800-4,000	2-6	Underflow Dams in Side Channels, Sorbents
	Unnamed Creek 1	Unnamed Crk 1 is a mountainous stream that fans out into the Dietrich R. This creek flows into the Dietrich gravel floodplain about 600 ft downstream from the pipeline. A leak in this buried portion of the pipeline will initially flow through the gravel material before surfacing. The most l kely location for the oil to surface is the east edge of the Dietrich floodplain. Containment could be accomplished by trenching the gravels and intercepting the subsurface flow of oil. During the winter, some intra-gravel flow of water may exist, also surfacing at the edge of the Dietrich floodplain. This water would build large aufeis fields.	10 to 25 ft	20 to 25	Summer	Low Flow	10-50	1-2	Trenches, Underflow Dams
						Rain Floods	50-150	2-4	Containment Pits, Sorbents
					Freezeup	Without Ice Cover	5-15	1-2	Trenches, Underflow Dams
						With Ice Cover	1-5	0-1	Containment Pits, Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Trenches, Containment Pits, Sorbents, Snow Berms
					Breakup	Before Ice Movement	10-50	1-2	Trenches, Underflow Dams
						After Ice Movement	50-200	2-6	Containment Pits, Sorbents
	Unnamed Creek 2	Unnamed Crk 2 is a mountainous stream that fans out into the Dietrich R. This creek flows into the Dietrich gravel floodplain about 600 ft downstream from the pipeline. A leak in this buried portion of the pipeline will initially flow through the east edge of the Dietrich floodplain. Containment could be accomplished by trenching the gravels and intercepting the subsurface flow of oil. During the winter, some intra-gravel flow of water may exist, also surfacing at the edge of the Dietrich floodplain. This water could build large aufeis fields.	10 to 25 ft	20 to 50 ft	Summer	Low Flow	10-50	1-2	Trenches, Underflow Dams
						Rain Floods	50-150	2-4	Containment Pits, Sorbents
					Freezeup	Without Ice Cover	5-15	1-2	Trenches, Underflow Dams
						With Ice Cover	1-5	0-1	Containment Pits, Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Trenches, Containment Pits, Sorbents, Snow Berms
					Breakup	Before Ice Movement	10-50	1-2	Trenches, Underflow Dams
						After Ice Movement	50-200	2-6	Containment Pits, Sorbents
	Unnamed Creek 3	Unnamed Crk 3 is a mountainous stream that fans out into the Dietrich R. This creek flows into the Dietrich gravel floodplain about 600 ft downstream from the pipeline. A leak in this buried portion of the pipeline will initially flow through the gravel material before surfacing. The most l kely location for the oil to surface is the east edge of the Dietrich floodplain. Containment could be accomplished by trenching the gravels and intercepting the subsurface flow of oil. During the winter, some intra-gravel flow of water may exist, also surfacing at the edge of the Dietrich floodplain. This water could build large aufeis fields.	10 to 25 ft	20 to 50 ft	Summer	Low Flow	10-50	1-2	Trenches, Underflow Dams
						Rain Floods	50-150	2-6	Containment Pits, Sorbents
					Freezeup	Without Ice Cover	5-15	1-2	Trenches, Underflow Dams
						With Ice Cover	1-5	1-2	Containment Pits, Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Trenches, Containment Pits, Sorbents, Snow Berms
					Breakup	Before Ice Movement	10-50	1-2	Trenches, Underflow Dams
						After Ice Movement	50-200	2-6	Containment Pits, Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Snowden Creek**	Snowden Crk flows in a wide gravel floodplain and joins the Dietrich R 1,800 ft downstream from the pipeline crossing. This is a steep gradient, turbulent stream, and during periods of open water it will be difficult to achieve complete containment of oil before it reaches the Dietrich R. However, partial containment could be accomplished using diversion booms with containment pits. During freezeup, flow will decrease rapidly and by early winter only intra-gravel flow will exist. During the winter, oil should be contained and removed before it can permeate into the aufeis and intra-gravel flow. During breakup and peak discharges, complete containment of oil will be extremely difficult.	10 to 25 ft	25 to 70 ft	Summer	Low Flow	20-100	1-3	Diversion Booms with Pits
						Rain Floods	100-300	2-6	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	10-40	1-2	Underflow Dams, Sorbents
						With Ice Cover	5-10	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	20-100	1-3	Diversion Booms with Pits
						After Ice Movement	100-500	2-7	Underflow Dams, Sorbents
	Disaster Creek	This creek flows in a narrow gravel floodplain and joins the Dietrich R 1,500 ft downstream from the pipeline crossing. This is a steep gradient, turbulent stream, and during periods of open water it will be difficult to achieve complete containment of oil before it reaches the Dietrich R. However, partial containment could be accomplished using underflow dams or diversion booms with containment pits. During freezeup, flow will decrease rapidly and by early winter only intra-gravel flow will exist. During the winter, oil should be contained and removed before it can permeate into the aufeis and intra-gravel flow. During breakup and peak discharges, complete containment of oil will be extremely difficult.	10 to 25 ft	25 to 70 ft	Summer	Low Flow	10-50	1-2	Diversion Booms with Pits
						Rain Floods	50-150	2-4	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	5-30	1-2	Underflow Dams, Sorbents
						With Ice Cover	1-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	30-50	1-3	Diversion Booms with Pits
						After Ice Movement	50-200	2-6	Underflow Dams, Sorbents
	Brockman Creek	This creek flows in a narrow gravel floodplain and joins the Dietrich R 1,800 ft downstream from the pipeline crossing. This is a steep gradient, turbulent stream, and during periods of open water it will be difficult to achieve complete containment of oil before it reaches the Dietrich R. However, partial containment could be accomplished using diversion booms with containment pits. During freezeup, flow will decrease rapidly and by early winter only intra-gravel flow will exist. During the winter, oil should be contained and removed before it can permeate into the aufeis and intra-gravel flow. During breakup and peak discharges, complete containment of oil will be extremely difficult.	10 to 25 ft	25 to 70 ft	Summer	Low Flow	20-80	1-3	Diversion Booms with Pits
						Rain Floods	80-250	2-4	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	5-30	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-10	1-2	
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	70-100	1-3	Diversion Booms with Pits
						After Ice Movement	100-500	2-7	Underflow Dams, Sorbents
	Middle Fork Koyukuk River (Upper Reach)	The Upper Reach of the Middle Fork Koyukuk R is considered to be from the Dietrich R (b) [redacted] (7). Throughout this reach the river flows in a split-channel pattern. During low flow periods, flow will normally be confined to one or two channels, but as the discharge increases two to four channels will carry water. During periods of low flow, gravel bars will be present that offer materials for constructing berms and containment facilities. Using diversion booms, oil could be diverted from the main channel into dry depressions in high-water channels, connected by excavated ditches. When rainstorms instigate high water levels, containment procedures are hampered by higher velocities, broader extent of surface water and more channels flowing water. If oil enters the channels along the side of the river, they could be used for partial or complete containment. It may be possible to berm off the upstream	100 to 200 ft	200 to 500 ft	Summer	Low Flow	600-1,500	1-3	Diversion Booms, Underflow Dams in Side Channels
						Rain Floods	1,500-10,000	2-5	Sorbents
					Freezeup	Without Ice Cover	50-250	1-2	Diversion Booms, Underflow Dams
						With Ice Cover	5-50	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-5	0-1	Underflow Dams, Sorbents, Trenches
					Breakup	Before Ice Movement	100-1,000	1-2	Diversion Booms, Underflow Dams

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
		entrance, thereby blocking water from flowing through. Similarly, berming the downstream exit would prevent oil from entering the main channel. Using the same techniques, oil could be diverted from the main channel into bermed off side channels used as temporary containment pits. During early freezeup, the discharge will decrease rapidly and ice will begin to form across the slow velocity reaches, but remain open in the riffles and high velocity reaches. The ice-covered pools are vis ble indicators of locations where diversion booming could be most efficient. Removal of some ice may be necessary. The oil could then be diverted, similar to as was discussed for the summer. An oil spill from the pipeline where it parallels the river could initially flow into the small side channels. Water will cease flowing in these channels during freezeup and containment could be achieved by blocking the downstream end of the channel. By winter, little or no flow of water will exist. Pools of water beneath the ice could be connected with intra-gravel flow. The flow may decrease downstream due to the formation of large aufeis fields. Since the pipeline is aboveground through most of this reach, emphasis should be placed on containing and removing the oil without letting it enter beneath the ice cover. If it does, trenching through the ice and gravel will be required to intercept and contain the oil. During breakup, containment procedures are hampered, due to the broad extent of water flowing at high discharges, velocities and the presence of floating ice. Emphasis should be placed on containing the oil before it reaches the main channel. This could be accomplished in backwater areas along the banks and in the side channels.				After Ice Movement	1,000-10,000	2-5	Underflow Dams in Side Channels, Sorbents
(b) (7)(F), (b) (3)	**Linda Creek**	Linda Crk flows in a very steep single channel. It flows directly into the Middle Fork Koyukuk R 700 ft downstream of the pipeline crossing. Containment of oil in this creek would best be accomplished on the alluvial fan at its mouth. Gravel materials are available to construct berms, containment pits and underflow dams. These structures need to be placed above the expected high water level of the Middle Fork Koyukuk R to prevent flooding of containment facilities. During freezeup, flow will decrease rapidly and cease by early winter. Some intra-gravel flow might persist and also form aufeis in the side channels. If oil enters intra-gravel flow, trenching will be required. During breakup, high flows in both Linda Crk and Middle Fork Koyukuk R will require caution and placement of facilities at the most logical location depending on field conditions.	5 to 15 ft	10 to 25 ft	Summer	Low Flow	2-25	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	25-160	2-5	Sorbents
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Sorbents
						With Ice Cover	0-5	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-25	1-2	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	25-200	2-5	Sorbents
	Gold Creek	Gold Crk flows in a very steep single channel. It flows directly into the Middle Fork Koyukuk R 900 ft downstream of the pipeline crossing. Containment of oil in the creek would best be accomplished on the alluvial fan at its mouth. Gravel materials are available to construct berms, containment pits and underflow dams. These structures need to be placed above the expected high water level of the Middle Fork Koyukuk R to prevent flooding of containment facilities. During freezeup, flow will decrease rapidly and cease by early winter. Some intra-gravel flow might persist and also form aufeis in the channels. If oil enters intra-gravel flow, trenching will be required. During breakup, high flows in both Linda Crk and Middle Fork Koyukuk R will require caution and placement of facilities at the most logical location depending on field conditions.	5 to 15 ft	10 to 25 ft	Summer	Low Flow	5-30	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	30-250	2-5	Sorbents
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Sorbents
						With Ice Cover	0-5	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	10-40	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	40-300	2-5	Sorbents
	Sheep Creek	Sheep Crk flows in a single channel that meanders through a well-vegetated floodplain. It enters the Middle Fork Koyukuk R 900 ft downstream from the pipeline crossing. Before it enters the Middle Fork Koyukuk R's main channel, it crosses a well-vegetated terrace level where the velocities would be slower and the implementation of containment procedures would be easier. During freezeup, flow will decrease rapidly and cease by early winter. Some intra-gravel flow might persist and also form aufeis in the channels. During breakup, high flows in both Sheep Crk and Middle Fork Koyukuk R will require caution and placement of facilities at the most logical location depending on field conditions.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	1-10	0-1	Underflow Dams, Sorbents
						Rain Floods	10-100	1-3	Blocking Dams
					Freezeup	Without Ice Cover	1-5	0-1	Underflow Dams, Sorbents
						With Ice Cover	0-1	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	5-10	0-1	Underflow Dams, Sorbents
						After Ice Movement	10-100	1-3	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Nugget Creek**	Nugget Crk flows in a single channel that meanders through a well-vegetated floodplain. It enters the Middle Fork Koyukuk R 900 ft downstream from the pipeline crossing. Before it enters the Middle Fork Koyukuk R's main channel, it crosses a well-vegetated terrace level where the velocities would be slower and the implementation of containment procedures would be easier. During freezeup, flow will decrease rapidly and cease by early winter. Some intra-gravel flow might persist and also form aufeis in the channels. During breakup, high flows in both Nugget Crk and Middle Fork Koyukuk R will require caution and placement of facilities at the most logical location depending on field conditions.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	1-10	0-1	Underflow Dams, Sorbents
						Rain Floods	10-100	1-3	Blocking Dams
					Freezeup	Without Ice Cover	1-50	1-14	Underflow Dams, Sorbents
						With Ice Cover	0-15	0-8	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	5-10	0-1	Underflow Dams, Sorbents
						After Ice Movement	10-100	1-3	
	Middle Fork Koyukuk River (Lower Reach)	The Lower Reach of the Middle Fork Koyukuk R is considered to be downstream of the Hammond (b) (7)(F),). Throughout this reach, the river flows in a split channel pattern. During low flow periods, flow will normally be confined to one or two channels, but as the discharge increases, two to four channels will carry water. During periods of low flow, gravel bars will be present that offer materials for constructing berms and containment facilities. Using diversion booms, oil could be diverted from the main channel into dry depressions in high-water channels, connected by excavated ditches. When rainstorms instigate high water levels, containment procedures are hampered by higher velocities, broader extent of surface water and more channels flowing water. If oil enters the channels along the side of the river, they could be used for partial or complete containment. It may be possible to berm off the upstream entrance, thereby blocking water from flowing through. Similarly, berming the downstream exit would prevent oil from entering the main channel. Using the same techniques, oil could be diverted from the main channel into bermed-off side channels, used as temporary containment pits. The belowground portion of the pipeline is located in gravel materials. A leak would initially flow through the gravel some distance before surfacing. Trenching will be required to intercept the subsurface flow of oil. During early freezeup, the discharge will decrease rapidly and ice will begin to form across the slow velocity reaches, but remain open in the riffles and high velocity reaches. The ice-covered pools are vis ble indicators of locations where diversion booming could be most efficient. Removal of some ice may be necessary. The oil could then be diverted similar to as was discussed for the summer. An oil spill from the pipeline where it parallels the river could initially flow into the small side channels. Water will cease flowing in most of these channels during freezeup and containment could be achieved by blocking the downstream end of the channel. Discharge greater than 10 cfs may exist throughout the winter. Pools of water beneath the ice cover could be connected with intra-gravel flow. The flow may decrease downstream due to the formation of large aufeis fields. Since the pipeline is aboveground through most of this reach, emphasis should be placed on containing and removing the oil without letting it enter beneath the ice cover. If it does, trenching through the ice and gravel will be required to intercept and contain the oil. During breakup, containment procedures are hampered, due to the broad extent of water flowing at high discharges, velocities and the presence of floating ice. Emphasis should be placed on containing the oil before it reaches the main channel. This could be accomplished in backwater areas along the banks and in the side channels.	150 to 300 ft	200 to 500 ft	Summer	Low Flow	600-1,500	1-3	Diversion Booms, Underflow Dams in Side Channels
						Rain Floods	1,500-10,000	2-4	Sorbents
					Freezeup	Without Ice Cover	50-250	1-2	Diversion Booms, Sorbents
						Aufeis Potential: High			Trenches
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Sorbents, Trenches
					Breakup	Before Ice Movement	100-1,000	1-2	Diversion Booms, Underflow Dams in Side Channels
						After Ice Movement	1,000-10,000	2-4	Sorbents
(b) (7)(F), (b) (3)	**Minnie Creek**	Minnie Crk flows in a meandering pattern with a relatively wide gravel floodplain. About 2,500 ft downstream from the pipeline crossing, it fans out into the Middle Fork Koyukuk gravel floodplain. During periods of low flow in the Middle Fork Koyukuk, this would be a good location to employ containment procedures. Gravel materials are available for constructing containment structures such as underflow dams, diversion berms, and containment pits. During periods of high flow, the Middle Fork Koyukuk may flood this area; however, this would cause backwater up Minnie Crk, slowing the velocities and allowing booming operations. Minnie Crk is subject to sudden increases in discharge during and following heavy rainfall. Flow in Minnie Crk will decrease rapidly during freezeup and will normally cease flow by early winter. During breakup, the high discharge, velocities, and flowing ice and debris will hamper containment. Backwater from the Middle Fork Koyukuk will slow velocities allowing booming operations.	30 to 60 ft	60 to 140 ft	Summer	Low Flow	20-120	1-2	Diversion Booms with Pits
						Rain Floods	200-800	2-4	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	10-50	0-1	Underflow Dams, Diversion Berms
						With Ice Cover	2-15	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	50-150	1-2	Diversion Booms with Pits
						After Ice Movement	150-800	2-4	Underflow Dams, Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Marion Creek**	Marion Crk flows in a meandering pattern with a relatively wide gravel floodplain. About 2,000 ft downstream from the pipeline crossing, it fans out into the Middle Fork Koyukuk gravel floodplain. During periods of low flow in the Middle Fork Koyukuk, this would be a good location to employ containment procedures. Gravel materials are available for constructing containment structures such as underflow dams, diversion berms, and containment pits. During periods of high flow, the Middle Fork Koyukuk may flood this area; however, this would cause backwater up Marion Crk, slowing the velocities and allowing booming operations. Marion Crk is subject to sudden increases in discharge during and following heavy rainfall. Flow in Minnie Crk will decrease rapidly during freezeup and will normally cease flow by early winter. During breakup, the high discharge, velocities, and flowing ice and debris will hamper containment. Backwater from the Middle Fork Koyukuk will slow velocities allowing booming operations.	25 to 40 ft	40 to 120 ft	Summer	Low Flow	10-100	1-2	Diversion Booms with Pits
						Rain Floods	100-700	2-4	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	5-40	0-1	Underflow Dams, Diversion Berms
						With Ice Cover	1-10	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	50-130	2-4	Underflow Dams
						After Ice Movement	120-800	2-4	Diversion Booms with Pits, Sorbents
	Slate Creek	Slate Crk flows in a meandering pattern with several wide gravel bars. About 4,000 ft downstream from the pipeline crossing, it fans out into the Middle Fork Koyukuk gravel floodplain. During periods of low flow in the Middle Fork Koyukuk, this would be a good location to employ containment procedures. Gravel materials are available for constructing containment structures such as underflow dams, diversion berms, and containment pits. During periods of high flow, the Middle Fork Koyukuk may flood this area; however, this would cause backwater up Slate Crk, slowing the velocities and allowing booming operations. Slate Crk is subject to sudden increases in discharge during and following heavy rainfall. Flow in Slate Crk will decrease rapidly during freezeup and will normally cease flow by early winter. During breakup the high discharge, velocities, and flowing ice and debris will hamper containment. Backwater from the Middle Fork Koyukuk, with slow velocities, should exist, allowing booming operations.	25 to 40 ft	40 to 120 ft	Summer	Low Flow	20-120	1-2	Diversion Booms with Pits
						Rain Floods	800-1,120	2-4	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	10-50	0-1	Underflow Dams, Diversion Berms
						With Ice Cover	2-15	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	50-150	1-3	Diversion Booms with Pits
						After Ice Movement	150-800	2-4	Underflow Dams, Sorbents
	Chapman Creek	Chapman Crk flows in a beaded pattern. A narrow, incised channel connects several pools. The pools may be relatively wide and deep and have very slow velocities, therefore, would make good containment sites. During breakup, the ice-filled pools may force wide flooding until the ice can be melted through.	5 to 25 ft	10 to 40 ft	Summer	Low Flow	10-40	0-1	Underflow Dams, Booms
						Rain Floods	40-240	1-2	Sorbents
					Freezeup	Without Ice Cover	5-15	0-1	Underflow Dams, Sorbents
						With Ice Cover	2-5	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	2-5	0-1	Blocking Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	10-30	0-1	Underflow Dams, Booms
						After Ice Movement	30-250	1-2	Sorbents
	South Fork Koyukuk River	The South Fork Koyukuk R flows in a meandering pattern. During low flow periods, water will usually be confined to one channel and the gravel floodplain will be exposed and offer materials for constructing berms and containment facilities. Using diversion booms, oil could be diverted from the main channel into depressions and into high-water channels, connected by excavated ditches. When rainstorms instigate high water levels, containment procedures are hampered by higher velocities, broader extent of water, and more channels flowing water. Containment could be best accomplished along the edge of the river where oil is entering. During early freezeup, the discharge will decrease rapidly and ice will begin to form across the slow velocity reaches but remain open in the riffles and high velocity reaches. The ice-covered pools are vis ble indicators of locations where diversion booming could be most efficient. Removal of some ice may be necessary. The oil could then be diverted. Similar to what was discussed for summer. By winter, flow will decrease with pools of water beneath the ice connected by intra-gravel flow. The flow may decrease downstream due to the formation of large aufeis fields. Emphasis should be placed on containing and removing the oil without letting it enter beneath the ice cover. If it does, trenching through the ice gravel will be required to intercept and contain the oil. During breakup, containment procedures are hampered due to the broad extent of water flowing at high discharges, velocities, and the presence of floating ice. Emphasis should be placed on containing the oil before it reaches the main channel. This could be accomplished in backwater areas along the banks and in the side channels.	100 to 200 ft	200 to 500 ft	Summer	Low Flow	400-2,000	1-3	Diversion Booms with Pits
						Rain Floods	2,000-6,000	1-2	Underflow Dams in Side Channels
					Freezeup	Without Ice Cover	200-600	1-2	Diversion Booms with Pits
						With Ice Cover	20-200	0-1	Underflow Dams in Side Channels
					Winter	Under Ice Flow Aufeis Potential: High	5-10	0-1	Snow Berms, Sorbents
					Breakup	Before Ice Movement	500-1,000	1-2	Diversion Booms with Pits
						After Ice Movement	1,000-6,000	2-5	Underflow Dams in Side Channels

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Aba-Dabba Creek**	This creek flows in a meandering pattern within an incised channel. It parallels the pipeline for several miles before entering the South Fork Koyukuk R. During the open water seasons, there are a few pools that would make good containment sites for booming. Where it enters the South Fork Koyukuk, there is gravel material available for constructing underflow dams. Flow will decrease rapidly during freezeup but some flow will persist through the winter, building large aufeis fields. During breakup, the ice-filled channels will force the water to flow on the vegetated floodplain until it can eat a channel through the ice.	5 to 15 ft	15 to 35 ft	Summer	Low Flow	5-10	1-2	Underflow Dams, Booms
						Rain Floods	80-200	1-3	Sorbents
					Freezeup	Without Ice Cover	5-20	0-1	Underflow Dams, Sorbents
						With Ice Cover	2-20	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0.5-1	0.5-1	Underflow Dams, Sorbents, Blocking Dams
					Breakup	Before Ice Movement	5-10	1-2	Booms Sorbents
						After Ice Movement	50-250	1-4	
	Grayling Creek	This small stream flows in a narrow, incised channel (depth of channel is 1 to 5 ft) within a willow-covered floodplain. Breakup was observed during two seasons and discharge during these time periods did not exceed 60 cfs. During periods of rain, this system does not change drastically with discharge normally between 2 and 5 cfs. Several ponds, located above and below the Dalton Hwy, occur on this system prior to its confluence with Grayling Lake. During the winter months, discharge is zero and aufeis has not been observed.	1 to 3 ft	3 to 10 ft	Summer	Low Flow	2-10	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	10-60	1-2	Sorbents
					Freezeup	Without Ice Cover	2-5	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Culvert Blocking, Snow Berms
					Breakup	Before Ice Movement	2-5	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	10-60	1-2	Sorbents
	Beaver Creek	Beaver Crk is located approximately 300 ft to the west of the workpad and is crossed three times by the Dalton Hwy. This is a small, spring-fed system with constant flow (minimal ice cover) throughout the year. The stream is shallow with a width of 10 to 20 ft and is predominantly pools. Several beaver dams exist on the system on the west side of the highway.	5 to 20 ft	10 to 20 ft	Summer	Low Flow	3-5	0-1	Underflow Dams, Culvert Blocking
						Rain Floods	5-10	1-2	
					Freezeup	Without Ice Cover	3-5	0-1	Underflow Dams, Culvert Blocking
						With Ice Cover	3-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	3-5	0-1	Underflow Dams, Culvert Blocking
					Breakup	Before Ice Movement	3-5	0-1	Underflow Dams, Culvert Blocking
						After Ice Movement	5-10	1-2	
	Jim River	The Jim R flows in a confined meander pattern within valley walls which rise at a medium slope from the narrow floodplain. Numerous oxbows and some active side channels exist within a well-vegetated floodplain. During breakup, the ice cover will break and jams are not uncommon. The river is flushed free of ice within 5 to 10 days with the exception of the extensive aufeis above and below the mouth of Douglas Crk. Constant flow with open water areas and snow bridges characterizes this system during the winter months. Discharge at the main crossing(b) (7)(F), (b) less than 2 cfs; however, there is extensive intra-gravel movement of water. Discharge increases as the Jim R approaches Prospect Crk where estimates of 30 to 40 cfs have been made. During the summer months, discharge ranges from 100 to 300 cfs; however, discharge will increase quickly in response to rain.	50 to 150 ft	150 to 500 ft	Summer	Low Flow	100-300	1-3	Diversion Booms with Pits
						Rain Floods	300-9,000	4-8	
					Freezeup	Without Ice Cover	100-300	1-3	Diversion Booms with Pits
						With Ice Cover	50-100	1-3	
					Winter	Under Ice Flow Aufeis Potential: High	2-50	1-2	Underflow Dams
					Breakup	Before Ice Movement	100-300	1-3	Diversion Booms with Pits
						After Ice Movement	300-7,000	2-7	
	Dee Creek	Dee Crk is crossed once by the pipeline and the Dalton Hwy. This is a small, spring-fed system with constant flow (minimal ice cover) throughout the year. The stream originates about 0.25 miles to the east of the workpad where it flows through a black-spruce bog area before entering the vegetated floodplain of the Jim R. Numerous ponds exist on the upstream side of the workpad; however, the stream is incised with undercut banks on the downstream side of the workpad.	4 to 10 ft	4 to 15 ft	Summer	Low Flow	3-5	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	5-15	1-2	Sorbents
					Freezeup	Without Ice Cover	3-5	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	3-5	1-2	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	3-5	1-2	Underflow Dams, Culvert Blocking, Sorbents
					Breakup	Before Ice Movement	3-5	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	5-15	1-2	Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Douglas Creek**	Douglas Crk originates in a deeply incised valley and enters a meandering pattern within a wide valley immediately above the pipeline crossing. Douglas Crk enters the Jim R about 500 feet downstream of the pipeline crossing after passing through the Dalton Hwy via a bridge and two multiplate culverts. This stream has continuous flow throughout the year with extensive aufeis upstream and downstream of the pipeline crossing. Aufeis has been observed to cover the entire Douglas Crk floodplain and a major portion of the Jim R floodplain. The extensive aufeis and amount of water (5 to 10 cfs) will make containment extremely difficult.	15 to 30 ft	30 to 70 ft	Summer	Low Flow	15-50	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	50-800	2-4	Sorbents
					Freezeup	Without Ice Cover	15-50	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	5-10	1-2	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	5-10	1-2	Culvert Blocking, Trenches, Snow Berms
					Breakup	Before Ice Movement	20-100	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	100-800	2-4	Sorbents
	Jim River Side Channel	The Jim R Side Channel is crossed twice by the pipeline and the Dalton Hwy. The side channel meanders through the well-vegetated Jim R floodplain. Flow characteristics for this side channel are dependent upon the Jim R; however, some spring activity exists to the east of the workpad throughout the year (e.g., Gas Bubble Slough). Flow occurs throughout the year with open water areas existing in the vicinity of both pipeline crossings. Aufeis covers the upper portion of the side channel; however, the source of water is believed to be Douglas Crk. The side channel is deeply incised with some exposed gravel bars. At breakup, during 1976, discharge was conservatively estimated at 2,000 cfs adjacent to the highway on the west side.	30 to 50 ft	50 to 200 ft	Summer	Low Flow	20-100	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	100-1,000	1-4	
					Freezeup	Without Ice Cover	20-50	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	20-30	1-2	
					Winter	Under Ice Flow Aufeis Potential: High	20-30	1-2	Underflow Dams, Diversion Booms
					Breakup	Before Ice Movement	20-100	1-2	Diversion Booms with Pits
						After Ice Movement	100-2,000	2-4	
	Little Piddler Creek	This stream is crossed once by both the pipeline and the Dalton Hwy. The system is deeply incised with banks 8 to 10 ft in height. Winter flow is zero, and summer discharge is fairly constant (2 to 4 cfs). The only periods when discharge would be high would be when the Jim R side channel overflows its banks.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-4	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	10-300	2-3	Sorbents
					Freezeup	Without Ice Cover	1-2	1-2	Blocking Dams, Culvert Blocking
						With Ice Cover	0	0	
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Culvert Blocking, Snow Berms
					Breakup	Before Ice Movement	2-4	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	10-300	2-3	Sorbents
	Prospect Creek	Prospect Crk flows in a meandering channel within a well-vegetated floodplain. Several oxbow lakes (abandoned channels) exist downstream of the pipeline crossing. Prospect Crk is incised with some exposed gravel bars at low flow. The stream builds extensive aufeis during the winter months such that overflow occurs during breakup and continues until the aufeis in the channel melts. Water will completely inundate the floodplain during breakup.	30 to 60 ft	60 to 600 ft	Summer	Low Flow	30-100	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	100-1,500	2-4	
					Freezeup	Without Ice Cover	20-50	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	5-20	1-2	
					Winter	Under Ice Flow Aufeis Potential: High	2-10	1-2	Underflow Dams, Trenches
					Breakup	Before Ice Movement	30-100	1-2	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	100-2,000	2-3	
	The Little Nasty	The Little Nasty is crossed once by the pipeline and the Dalton Hwy. This stream is narrow and deeply incised (depth of channel 2 to 6 ft) with dense vegetation in the floodplain. This stream has a constant flow throughout the year with discharge probably approaching 2 cfs during late winter. Aufeis conditions vary greatly season to season.	1 to 5 ft	5 to 50 ft	Summer	Low Flow	4-7	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	10-100	1-2	Sorbents, Booms
					Freezeup	Without Ice Cover	4-7	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	3-5	1-2	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	2-4	1-2	Underflow Dams, Culvert Blocking, Blocking Dams, Trenching
					Breakup	Before Ice Movement	4-7	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	10-100	1-2	Sorbents, Booms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**South Fork of the Little Nasty**	The South Fork of the Little Nasty is crossed once by the pipeline and the Dalton Hwy. This stream is narrow and deeply incised (depth of channel 1 to 4 ft) with dense vegetation in the floodplain. This stream has minimal winter flow and some aufeis buildup in the vicinity of the Dalton Hwy.	1 to 3 ft	3 to 30 ft	Summer	Low Flow	1-4	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	4-60	1-2	Sorbents
					Freezeup	Without Ice Cover	1-2	0-1	Underflow Dams, Culvert Blocking
						With Ice Cover	0-1	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Blocking Dams, Culvert Blocking
					Breakup	Before Ice Movement	1-4	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	4-60	1-2	Sorbents
	North Fork of Bonanza Creek	The North Fork of Bonanza Crk flows in a meandering channel within a well-vegetated floodplain. Several oxbow lakes (abandoned channels) exist downstream of the pipeline crossing. Cut banks, debris, and exposed gravel bars characterize this system. Discharge decreases significantly at freezeup, and winter flow in the vicinity of the pipeline crossing was not present during 1975-1976 winter season. Intra-gravel movement of water was also minimal during this winter season; however, open water existed in the North Fork of Bonanza Crk immediately above its confluence with the South Fork of Bonanza Crk.	40 to 60 ft	60 to 100 ft	Summer	Low Flow	50-100	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	100-2,000	2-4	
					Freezeup	Without Ice Cover	10-50	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	5-10	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	30-100	1-2	Underflow Dams ,Diversion Booms with Pits
						After Ice Movement	100-2,000	2-4	
	South Fork of Bonanza Creek	The South Fork of Bonanza Crk flows in a meandering channel within a well-vegetated floodplain. Several oxbow lakes (abandoned channels) exist downstream of the pipeline crossing. Cut banks, debris, and exposed gravel bars characterize this system. Discharge decreases significantly at freezeup; however, open water (5 cfs) existed until February during the winter of 1975 - 1976. Intra-gravel movement of water was extensive at the pipeline crossing during the winter of 1975 - 1976, and open water existed in Bonanza Crk.	40 to 60 ft	60 to 120 ft	Summer	Low Flow	50-100	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	100-2,500	2-4	
					Freezeup	Without Ice Cover	10-50	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	5-20	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Underflow Dams, Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	50-100	1-2	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	100-2,500	2-4	
	Pung's Crossing Creek	Pung's Crossing Crk is crossed once by the pipeline and once by the Dalton Hwy. This Bonanza Crk tributary flows in a narrow, incised channel; the stream is characterized by cut banks, debris, and riffles which represent approximately 70 percent of this system. Several beaver ponds, one about 3 to 5 acres, exist on the lower portion of this stream. The aufeis potential is high with the entire channel filling with ice during the winter months.	5 to 10 ft	10 to 50 ft	Summer	Low Flow	2-10	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	10-200	2-4	Sorbents
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	0-2	1-2	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Culvert Blocking, Snow Berms, Trenches
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	10-200	2-4	Sorbents
	Alder Mountain Creek	Alder Mountain Crk is crossed once by the pipeline and the Dalton Hwy. This Fish Crk tr butary flows in a narrow, incised channel; the stream is characterized by cut banks, debris, and riffles which represent approximately 70 percent of this system. The aufeis potential of this stream is high with the entire channel filling with ice during the winter months.	3 to 10 ft	10 to 50 ft	Summer	Low Flow	2-10	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	10-200	2-4	Sorbents
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	0-2	1-2	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Blocking Dams, Culvert Blocking, Snow Berms, Trenches
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	10-100	2-4	Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Fish Creek**	Fish Crk flows in a meandering pattern within a moderately wide floodplain which is heavily vegetated. Several oxbow lakes (abandoned channels) exist downstream of the pipeline crossing. R ice often freezes fast to the river bed with some aufeis buildup. Discharge during the winter of 1975 - 1976 was estimated to be zero.	30 to 50 ft	50 to 80 ft	Summer	Low Flow	50-100	1-2	Underflow Dams, Diversion Booms with Pits
						Rain Floods	100-2,000	2-4	
					Freezeup	Without Ice Cover	20-50	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	5-20	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Underflow Dams, Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	50-100	1-2	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	100-1,500	2-4	
	Middle Fork of Fish Creek	The Middle Fork of Fish Crk is crossed once by the pipeline. This stream flows in a meandering pattern within a well-vegetated floodplain. The channel is incised with undercut banks and some debris. In the vicinity of the pipeline, aufeis has not been observed.	5 to 15 ft	15 to 30 ft	Summer	Low Flow	5-20	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	20-250	2-4	Sorbents
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	0-5	1-2	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Culvert Blocking, Snow Berms, Trenches
					Breakup	Before Ice Movement	5-20	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	20-200	2-4	Sorbents
	South Fork of Fish Creek	The South Fork of Fish Crk is crossed once by the pipeline. This stream flows in a meandering pattern within a well-vegetated floodplain. The channel is incised with undercut banks and some debris. In the vicinity of the pipeline crossing, aufeis has not been observed. However, extensive aufeis has been observed in the lower portion of this stream, specifically where it is crossed by AR 87-APL-3B.	10 to 20 ft	20 to 50 ft	Summer	Low Flow	5-20	1-2	Underflow Dams, Sorbents
						Rain Floods	20-300	2-4	
					Freezeup	Without Ice Cover	5-10	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-5	1-2	
					Winter	Under Ice Flow Aufeis Potential: High	1-3	1-2	Underflow Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	5-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	20-300	2-4	
	Netsch's Creek	Three branches of Netsch's Crk are crossed by the pipeline and the Dalton Hwy. The stream flows within a narrow floodplain covered with willow. The channel is not well defined and the gradient is such that few pools exist. Minimal (less than 3 cfs) flow exists throughout the summer months and aufeis has been observed on all branches near the pipeline and the Dalton Hwy.	1 to 4 ft	4 to 20 ft	Summer	Low Flow	1-3	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	3-100	1-2	
					Freezeup	Without Ice Cover	1-3	1-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Blocking Dams, Trenches, Snow Berms, Culvert Blocking
					Breakup	Before Ice Movement	1-3	1-2	Underflow Dams, Culvert Blocking
						After Ice Movement	3-100	1-15	
	Kanuti River	The Kanuti R flows in a well-defined, incised single channel. The banks are relatively steep and well vegetated. During the open-water season, this gently sloping river does not have high velocities; therefore, booming operations should be practicable. However, about 3 river miles below the pipeline crossing, the Kanuti R enters a canyon where there are long stretches of high velocity water with large pools spaced intermittently through this zone. At freezeup, flow diminishes rapidly and during February of 1976 when the pipe was buried, water was not hit until 11 ft below the bottom of the channel. Breakup as observed for two seasons was gradual with overflow occurring and minimal floating ice.	70 to 120 ft	100 to 150 ft	Summer	Low Flow	50-200	0.5-1	Underflow Dams, Diversion Booms
						Rain Floods	200-1,200	1-2	
					Freezeup	Without Ice Cover	20-100	0.5-1	Underflow Dams, Diversion Booms
						With Ice Cover	5-30	0.5-1	
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	20-200	0.5-1	Diversion Booms
						After Ice Movement	200-1,200	1-2	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Caribou Mountain Creek**	This Olson Lake Crk tributary is crossed once by the pipeline and the workpad. The stream flows in a meandering pattern within a willow floodplain. The channel is deeply incised with undercut banks. In the lower portion of Caribou Mountain Crk, downstream of the Dalton Hwy, numerous beaver ponds exist. Aufeis has not been observed in this system.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-20	1-2	Underflow Dams, Culvert Blocking
						Rain Floods	20-250	1-2	Sorbents
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Culvert Blocking
						With Ice Cover	0-5	0-1	Sorbents, Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Culvert Blocking, Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	20-250	1-2	Culvert Blocking
	Olsons Lake Creek	This creek flows in an incised channel within a heavily willowed, vegetated floodplain. The stream is characterized by undercut banks and high-water velocities where the stream channel is restricted (less than one foot in width). Numerous pools exist where velocities are about 0.5 to 2 fps. In the lower portion of Olsons Lake Crk, about 3 river miles below the pipeline crossing, numerous ponds exist. The water velocity in these areas approaches 0.5 fps. Winter flow is minimal with a high potential for aufeis formation.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-5	0.5-2	Underflow Dams, Sorbents
						Rain Floods	5-80	1-2	
					Freezeup	Without Ice Cover	1-5	0.5-2	Underflow Dams, Sorbents
						With Ice Cover	0-1	0.5-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	2-5	0.5-2	Underflow Dams, Sorbents
						After Ice Movement	5-100	1-15	
	Finger Mountain Creek	This creek flows in an incised channel; however, some areas exist where the channel is not well defined. The narrow floodplain is covered with willow, and in most locations the channel is completely covered by stream bank vegetation. Pools are not numerous; however, those that occur downstream of the pipeline have surface velocities of less than 1 fps.	1 to 5 ft	5 to 20 ft	Summer	Low Flow	1-5	0-1	Underflow Dams, Sorbents
						Rain Floods	5-50	1-2	
					Freezeup	Without Ice Cover	1-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	1-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-50	1-2	
	North Fork of the West Fork of the Dall River	This river has an incised channel and flows within a heavily vegetated willow floodplain. The stream is characterized by undercut banks, and active thermal erosion has been observed on this system downstream of the pipeline. Water velocities are high due to the restricted nature of the channel; however, pools exist throughout its length where velocities are less than 2 fps.	1 to 4 ft	4 to 15 ft	Summer	Low Flow	1-5	1-2	Underflow Dams, Sorbents
						Rain Floods	5-50	1-2	
					Freezeup	Without Ice Cover	1-3	1-2	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	1-5	1-2	Underflow Dams, Sorbents
						After Ice Movement	5-50	1-2	
	Middle Fork of the West Fork of the Dall River	This river flows within a heavily vegetated willow floodplain. The channel is incised with cut banks 4 to 8 ft in height. The stream is characterized by undercut banks, debris and active thermal erosion has been observed downstream of the pipeline. Aufeis has not been observed on this creek.	3 to 10 ft	10 to 15 ft	Summer	Low Flow	2-15	0.5-2	Underflow Dams, Sorbents
						Rain Floods	15-100	9	
					Freezeup	Without Ice Cover	2-5	0.5-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	2-15	0.5-2	Underflow Dams, Sorbents
						After Ice Movement	20-100	1-2	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**South Fork of the West Fork of the Dall River**	This river has an incised channel with steep, willow-covered banks. Several pools exist in the meanders where velocities would be reduced. The stream is characterized by undercut banks, debris, and active thermal erosion has been observed below the pipeline crossing.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-20	0.5-1	Underflow Dams, Sorbents
						Rain Floods	20-230	1-2	
					Freezeup	Without Ice Cover	2-20	0.5-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	2-40	0.5-1	Underflow Dams, Sorbents
						After Ice Movement	40-230	9	
	Fed Creek	At the pipeline crossing, this stream flows in an incised channel within a heavily vegetated floodplain (willow and black spruce). Numerous debris jams exist, and banks are undercut. Fed Crk parallels the pipeline for about four miles before entering the North Fork of the Ray R.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	3-15	1-2	Underflow Dams, Sorbents
						Rain Floods	15-200	1-2	
					Freezeup	Without Ice Cover	1-3	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	3-15	1-2	Underflow Dams, Sorbents
						After Ice Movement	15-200	1-2	
	North Fork of the Ray River	This river flows in a meandering pattern with an incised channel. The banks are well-vegetated with willow and white spruce. This gently sloped stream has some local reaches that are pooled with slow velocities.	20 to 40 ft	40 to 60 ft	Summer	Low Flow	20-50	0.5-1	Underflow Dams, Diversion Booms
						Rain Floods	50-800	1-2	
					Freezeup	Without Ice Cover	10-20	0.5-1	Diversion Booms, Underflow Dams
						With Ice Cover	0-5	0.5-1	
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	20-50	0.5-1	Diversion Booms, Underflow Dams
						After Ice Movement	50-800	9	
	Ray River	The Ray R flows in a meandering pattern within a well-vegetated spruce and willow floodplain. Several abandoned channels (oxbow lakes) exist that could be used advantageously during containment procedures. During normal flow, the river flows in a pool and riffle sequence and several gravel bars are exposed that offer materials for containment. When the Yukon R experiences floods during summer or breakup, the Ray R will back up and flood its banks.	40 to 80 ft	80 to 105 ft	Summer	Low Flow	100-500	1-2	Diversion Booms with Pits
						Rain Floods	500-3,000	1-4	
					Freezeup	Without Ice Cover	20-100	1-2	Diversion Booms with Pits
						With Ice Cover	10-40	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	50-200	1-2	Diversion Booms with Pits
						After Ice Movement	200-2,000	1-4	
	Fort Hamlin Hills Creek	This stream flows in an incised channel that meanders through a well-vegetated floodplain. The spruce trees and willows offer debris into the stream that can often jam up, slowing velocities locally. Undercut banks and a high amount of debris characterize this system.	5 to 15 ft	15 to 40 ft	Summer	Low Flow	10-25	0.5-1	Underflow Dams, Sorbents
						Rain Floods	25-500	1-2	Culvert Blocking
					Freezeup	Without Ice Cover	5-15	0.5-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	Sorbents, Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	5-60	0.5-1	Underflow Dams, Sorbents
						After Ice Movement	60-500	1-2	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This Ray R tributary flows within a restricted valley and is characterized by a steep gradient. The Dalton Hwy is located downstream from the pipeline. Flow is intermittent and aufeis may be extensive.	2 to 4 ft	4 to 10 ft	Summer	Low Flow	4-10	1-2	Underflow Dams, Sorbents
						Rain Floods	10-120	2-4	Culvert Blocking
					Freezeup	Without Ice Cover	0-1	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Culvert Blocking, Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Culvert Blocking, Snow Berms, Trenches
					Breakup	Before Ice Movement	4-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-120	2-3	
		This Ray R tributary flows within a restricted valley and is characterized by a steep gradient. The Dalton Hwy is located about 150 yards downstream of the pipeline. Flow is intermittent and aufeis may be extensive.	2 to 4 ft	4 to 8 ft	Summer	Low Flow	1-5	1-2	Underflow Dams, Sorbents
						Rain Floods	5-60	2-3	Culvert Blocking
					Freezeup	Without Ice Cover	0-1	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents, Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Culvert Blocking, Snow Berms, Trenches
					Breakup	Before Ice Movement	2-5	1-2	Underflow Dams, Sorbents
						After Ice Movement	5-60	2-3	
		This Ray R tributary is characterized by a steep gradient and an incised channel with a heavily vegetated willow floodplain. Flow is intermittent, and aufeis may be extensive.	2 to 4 ft	4 to 8 ft	Summer	Low Flow	3-8	1-2	Underflow Dams, Sorbents
						Rain Floods	8-70	2-3	
					Freezeup	Without Ice Cover	0-1	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	3-8	1-2	Underflow Dams, Sorbents
						After Ice Movement	8-70	2-3	
		This Ray R tributary is characterized by a steep gradient and an incised channel with a heavily vegetated willow floodplain. Flow is intermittent and aufeis may be extensive.	2 to 4 ft	4 to 8 ft	Summer	Low Flow	4-10	1-2	Underflow Dams, Sorbents
						Rain Floods	10-100	2-3	
					Freezeup	Without Ice Cover	0-1	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	4-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-100	2-3	
		This stream has an incised channel and flows in a meandering pattern through a willow and spruce floodplain. The stream is characterized by undercut banks with numerous debris jams. Active erosion of the banks has been observed. The stream intersects the winter trail about 150 yards below the pipeline crossing where debris jams have caused water to pond and flow within the winter trail.	2 to 5 ft	5 to 10 ft	Summer	Low Flow	5-15	1-2	Underflow Dams, Sorbents
						Rain Floods	15-150	1-2	
					Freezeup	Without Ice Cover	3-5	1-2	Underflow Dams, Sorbents
						With Ice Cover	1-2	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	5-15	1-2	Underflow Dams, Sorbents
						After Ice Movement	15-150	1-2	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Phelps Creek**	This stream has an incised channel and flows in a meandering pattern through a willow and spruce floodplain. The stream is characterized by undercut banks with numerous debris jams. Active erosion of the banks has been observed. The stream intersects the winter trail about 100 yards below the pipeline crossing where debris jams have caused water to pond and flow within the winter trail.	2 to 5 ft	5 to 10 ft	Summer	Low Flow	5-20	1-2	Underflow Dams, Sorbents
						Rain Floods	20-200	1-2	
					Freezeup	Without Ice Cover	3-5	1-2	Underflow Dams, Sorbents
						With Ice Cover	1-3	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	1	1	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	5-30	1-2	Underflow Dams, Sorbents
						After Ice Movement	30-200	1-2	
	Woodchopper Creek	This intermittent creek has an incised channel that flows through a willow and spruce floodplain. Debris often jams in the channel slowing the velocities. Active thermal erosion of the banks has been observed.	3 to 10 ft	10 to 15 ft	Summer	Low Flow	0-10	1-2	Underflow Dams, Blocking Dams
						Rain Floods	10-150	1-2	Sorbents, Culvert Blocking
					Freezeup	Without Ice Cover	0-2	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0	0	Sorbents, Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-50	1-2	
	Burbot Creek	This intermittent creek has an incised channel that flows through a willow and spruce floodplain. Debris often jams in the channel slowing the velocities. Active thermal erosion of the banks has been observed.	3 to 10 ft	10 to 15 ft	Summer	Low Flow	14	1-2	Underflow Dams, Blocking Dams
						Rain Floods	4-50	1-2	Sorbents, Culvert Blocking
					Freezeup	Without Ice Cover	0-2	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0	0	Sorbents, Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Trenches
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-50	15	
	Yukon River	At the pipeline crossing and downstream to the Tanana R confluence, the Yukon R flows in a single, confined channel with an occasional high-water channel. During the summer, flow variations will respond to rainstorm events that occur upstream, and often beyond what the local weather may indicate. During freezeup, flow in the river will decrease rapidly. Ice will begin to form as pan ice and flow until it accumulates in slow velocity areas or constrictions. Freezeup ice jams may occur, raising the water level rapidly upstream. Ice bridges will form across the river and open-water leads will persist until the river is completely ice-covered. During the winter, the ice thickness will vary between two and six ft, depending on weather and snow cover. In the near vicinity of the Yukon R, the pipeline is above ground; therefore, during the winter, oil would probably enter the river on top of the ice. Containment and cleanup should prevent oil from entering the water beneath the ice. During breakup, containment of oil in the Yukon R will be limited to the point of entry into the system. However, the high stage in the Yukon R will cause water to backup the tributaries, slowing down the velocities, and allowing containment prior to the Yukon.	1,500 to 3,000 ft	2,000 to 4,000 ft	Summer	Low Flow	150,000-300,000	2-3	Diversion Booms
						Rain Floods	180,000-800,000	2-4	
					Freezeup	Without Ice Cover	50,000-180,000	1-2	Diversion Booms
						With Ice Cover	25,000-60,000	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	10,000-25,000	0-1	Ice Notches, Diversion Booms
					Breakup	Before Ice Movement	60,000-200,000	1-3	Diversion Booms
						After Ice Movement	200,000-800,000	2-4	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This intermittent stream flows in a grass and willow floodplain without a well-defined channel. The dense vegetation will offer considerable resistance to flow.	1 to 5 ft	5 to 20 ft	Summer	Low Flow	0-5	0-1	Blocking Dams, Underflow Dams
						Rain Floods	1-25	1-2	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	2-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-25	1-2	
(b) (7)(F), (b) (3)	**Isom Creek**	Isom Crk flows in an incised channel (2 to 6 ft deep) within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. During breakup, snowmelt runoff causes peak discharges for 5 to 10 days that may overflow the banks. The winter ice cover forms in layers as the flow decreases, such that voids may exist between each layer.	3 to 10 ft	10 to 20 ft	Summer	Low Flow	2-40	1-2	Underflow Dams, Diversion Booms
						Rain Floods	40-200	1-4	Sorbents
					Freezeup	Without Ice Cover	2-20	1-2	Underflow Dams, Blocking Dams
						With Ice Cover	1-5	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-1	0-1	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	20-200	1-3	Sorbents
	Hess Creek	Hess Crk is characterized by an irregular meandering pattern within a broad floodplain. Several oxbow lakes and abandoned channels exist downstream of the pipeline crossing which could be used as storage areas during containment procedures. In addition, gravel point bars exist on the inside of each meander, which provide gravel materials for constructing berms and modifying the channel to slow velocities or divert flow. During the summer, the discharge in Hess Crk responds rather quickly to rainstorms, and flood flows may rise within one day. Overbank flooding can be caused by log jams that commonly occur in this stream. During normal summer flow, the creek flows in a pool and then a riffle sequence. At freezeup, the discharge drops quickly, with an ice cover forming first in the pools and then in the riffles. During the winter, the discharge will drop to between 0 and 5 cfs. Intragravel flow may exist in the riffles with pooled water persisting throughout the winter beneath the ice cover in the deeper pools. During the initial stages of breakup, water will eventually raise the ice cover, break it free, and begin the flow of ice downstream. Ice jams are common in Hess Crk, which causes overbank flooding. During rainstorm floods and breakup peak discharges, containment of oil in Hess Crk may be extremely difficult.	50 to 150 ft	150 to 400 ft	Summer	Low Flow	50-800	1-2	Diversion Booms, Underflow Dams
						Rain Floods	800-8,000	2-5	
					Freezeup	Without Ice Cover	50-150	1-2	Diversion Booms, Underflow Dams
						With Ice Cover	5-50	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Underflow Dams, Trenches, Snow Berms, Sorbents
					Breakup	Before Ice Movement	200-2,000	1-3	Diversion Booms
						After Ice Movement	2,000-8,000	2-5	
(b) (7)(F), (b) (3)		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before the flow decreases to the normal summer flow.	3 to 5 ft	5 to 15 ft	Summer	Low Flow	0-10	0-1	Underflow Dams, Blocking Dams
						Rain Floods	10-50	1-3	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-50	1-3	
		This stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days, before flow decreases to the normal summer flow.	3 to 5 ft	5 to 20 ft	Summer	Low Flow	2-20	0-1	Underflow Dams, Blocking Dams
						Rain Floods	20-100	1-3	Sorbents
					Freezeup	Without Ice Cover	1-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	20-100	1-3	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	5-30	1-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	1-2	Underflow Dams, Sorbents
						After Ice Movement	5-30	1-3	
(b) (7)(F), (b) (3)	Hot Cat Creek	This stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-20	0-1	Underflow Dams, Sorbents
						Rain Floods	20-150	1-3	
					Freezeup	Without Ice Cover	2-10	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	20-150	1-3	
(b) (7)(F), (b) (3)		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 5 ft	5 to 10 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	5-30	1-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-30	1-3	
		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 5 ft	5 to 10 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	5-30	1-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-30	1-3	
		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 5 ft	5 to 20 ft	Summer	Low Flow	2-20	1-2	Underflow Dams, Sorbents
						Rain Floods	20-100	1-3	
					Freezeup	Without Ice Cover	2-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	20-100	1-3	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	5-25	1-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-30	1-3	
		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 5 ft	5 to 15 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	2-25	0-2	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	1-2	Underflow Dams, Sorbents
						After Ice Movement	5-30	1-3	
–	**Mastodon Creek**	Mastodon Crk is not crossed by the pipeline, but it does receive some east slope drainage from the workpad. This creek flows in an incised channel with a heavy vegetated floodplain. Debris often jams within the channel causing backwater and possible overbank flooding. Flow decreases rapidly during freezeup and ceases by winter. During breakup, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	5 to 10 ft	10 to 25 ft	Summer	Low Flow	5-25	0-1	Underflow Dams, Sorbents
						Rain Floods	25-150	1-3	Booms
					Freezeup	Without Ice Cover	2-10	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	Booms
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	5-25	1-2	Underflow Dams, Sorbents
						After Ice Movement	25-150	1-3	
(b) (7)(F), (b) (3)	**Fish Creek**	Fish Crk flows in an incised channel within a well-vegetated floodplain. At and near the pipeline crossing, Fish Crk is in the Hess floodplain. When rain floods or breakup occurs in Hess Crk, the lower reaches of Fish Crk will have low velocities due to the backwater effects and possible overbank flooding. During freezeup, flow decreases rapidly and ceases during most winters.	10 to 25 ft	25 to 40 ft	Summer	Low Flow	20-89	0-1	Underflow Dams, Diversion Booms
						Rain Floods	80-600	1-3	Sorbents
					Freezeup	Without Ice Cover	10-20	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	2-10	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-80	0-1	Diversion Booms, Underflow Dams
						After Ice Movement	80-600	1-3	Sorbents
	Erickson Creek	Erickson Crk flows in an incised channel that is bounded by a relatively narrow floodplain that supports a dense growth of brush and trees. Undercut banks are common with a vegetative mat overhanging. Debris often jams within the channel. During periods of high flow, backwater and overbank flooding may occur. During the freezeup period, flow decreases rapidly. During the breakup period, snow-melt runoff causes peak discharges that will last for 5 to 10 days, then the flow decreases to the normal summer discharge.	10 to 25 ft	25 to 40 ft	Summer	Low Flow	10-60	0-1	Underflow Dams, Diversion Booms
						Rain Floods	60-600	1-3	Sorbents
					Freezeup	Without Ice Cover	10-20	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	2-10	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	2-5	0-1	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	10-50	0-1	Diversion Booms, Underflow Dams
						After Ice Movement	50-600	1-3	Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris and vegetation will offer considerable resistance to the flow of oil and water. Flow ceases during the dry, summer period and the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 5 days before flow decreases to the normal summer flow.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	5-40	1-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-40	1-3	
		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	0-10	0-1	Underflow Dams, Blocking Dams
						Rain Floods	10-100	1-2	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-100	1-2	
		This intermittent stream flows in an undefined channel within a floodplain that supports a dense growth of brush and trees. Debris and vegetation will offer considerable resistance to the flow of water and oil. Flow ceases during dry periods in the summer and the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 5 days before flow decreases to the normal summer flow.	2 to 5 ft	5 to 15 ft	Summer	Low Flow	0-5	0-1	Underflow Dams, Blocking Dams
						Rain Floods	5-40	1-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-5	0-1	Underflow Dams, Sorbents
						After Ice Movement	5-40	1-3	
(b) (7)(F), (b) (3)	**Lost Creek**	Lost Crk flows in an incised channel that meanders in a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel during periods of high flow, causing backwater and overbank flooding. During the freezeup period, flow decreases rapidly and then ceases to flow by winter. During breakup, snow-melt runoff causes peak discharges that cause overbank flooding and will last for 5 to 10 days. The stream responds quickly to rainstorm events.	10 to 25 ft	25 to 40 ft	Summer	Low Flow	10-100	1-3	Underflow Dams, Booms
						Rain Floods	100-600	2-5	Sorbents
					Freezeup	Without Ice Cover	5-20	1-2	Underflow Dams, Sorbents
						With Ice Cover	1-10	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	10-100	1-3	Underflow Dams, Booms
						After Ice Movement	100-600	2-5	Sorbents
	Tolovana River	The Tolovana R is characterized by an incised channel that meanders irregularly through a broad floodplain vegetated by dense brush and trees. Several oxbow lakes and abandoned channels exist in the floodplain which could be used as storage areas during containment procedures. In addition, gravel point bars exist on the inside of each meander which provide gravel materials for constructing berms and modifying the channel to slow velocities and divert flow. During freezeup, the ice cover will first form over the pools and then in the riffles. During the winter, some pools may have snow bridges across them without any significant ice layer. At the confluence of the West Fork of the Tolovana, the ice cover freezes solid with an ice thickness of 2 to 4 ft. During the initial states of breakup, water will begin to flow over the bedfast ice. The rise in water level will eventually raise the ice cover, break it free, and begin the flow of ice downstream. Ice jamming is not common during breakup but considerable debris will be floating in the channel. Because of the floating debris, containment of oil during rain floods and breakup peak discharges may be extremely difficult.	35 to 55 ft	55 to 90 ft	Summer	Low Flow	50-1,000	1-2	Underflow Dams, Diversion Booms
						Rain Floods	1,000-6,000	1-3	
					Freezeup	Without Ice Cover	30-150	0-1	Diversion Booms, Underflow Dams
						With Ice Cover	20-40	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	2-10	0-1	Underflow Dams, Trenches, Snow Berms, Sorbents
					Breakup	Before Ice Movement	200-2,000	1-2	Diversion Booms
						After Ice Movement	2,000-6,000	1-3	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This intermittent stream flows in an incised channel within a floodplain that supports a dense growth of brush and trees. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly and then ceases during the freezeup period. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 5 ft	5 to 15 ft	Summer	Low Flow	0-10	0-1	Underflow Dams, Blocking Dams
						Rain Floods	10-50	1-3	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-10	1-2	Underflow Dams, Sorbents
						After Ice Movement	10-50	1-3	
(b) (7)(F), (b) (3)	**Shorty Creek**	This stream flows in an incised channel within a narrow, well-vegetated floodplain. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly during freezeup and ceases by early winter. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 8 ft	8 to 15 ft	Summer	Low Flow	2-20	0-3	Underflow Dams, Blocking Dams
						Rain Floods	20-110	1-3	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	20-110	1-3	
	Wilber Creek	This stream flows in an incised channel within a narrow, well-vegetated floodplain. Debris often jams within the channel, and during periods of high flow, backwater and overbank flooding may occur. Flow decreases rapidly during freezeup and ceases by early winter. During the breakup period, snow-melt runoff causes peak discharges for 3 to 10 days before flow decreases to the normal summer flow.	3 to 8 ft	8 to 15 ft	Summer	Low Flow	2-20	1-2	Underflow Dams, Blocking Dams
						Rain Floods	25-130	1-3	Sorbents
					Freezeup	Without Ice Cover	1-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams, Sorbents
						After Ice Movement	25-130	1-3	
	Slate Creek	Slate Crk at the pipeline crossing is a single, incised channel that meanders in a moderately wide floodplain. Dense vegetation exists along its banks. Winter flow may be intermittent; the presence of active aufeis will indicate flow beneath the ice or intragravel flow upstream.	10 to 20 ft	30 to 40 ft	Summer	Low Flow	10-100	1-3	Underflow Dams, Diversion Booms
						Rain Floods	100-600	2-4	Sorbents
					Freezeup	Without Ice Cover	10-20	0-1	Underflow Dams, Sorbents
						With Ice Cover	0-10	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0-10	0-1	Underflow Dams, Blocking Dams
					Breakup	Before Ice Movement	0-50	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	50-600	2-5	
	Tatalina River	The Tatalina R at the pipeline crossing is a single, incised channel meandering in a broad floodplain with densely wooded and vegetated banks. The dense tree cover along the banks is a source of debris which collects in the form of log jams, particularly in high-water channels. The initial stages of breakup, before ice movement, have been observed to be gradual with flow over the ice that eventually will eat a channel into it.	20 to 60 ft	60 to 120 ft	Summer	Low Flow	50-700	1-2	Diversion Booms, Underflow Dams
						Rain Floods	700-2,000	2-3	
					Freezeup	Without Ice Cover	3-10	0-1	Underflow Dams, Overflow Berms
						With Ice Cover	2-10	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	2-10	0.5-1	Underflow Dams, Overflow Berms
					Breakup	Before Ice Movement	50-700	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	500-2,500	2-4	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	This tributary to the Tatalina R is crossed by the pipeline (b) (7)(F), (b) is a small, intermittent stream with dense vegetation along the banks.	5 to 10 ft	30 to 40 ft	Summer	Low Flow	0-20	0-1	Underflow Dams, Overflow Berms
						Rain Floods	20-150	1-2.5	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0	0	
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	5-20	0-1	Underflow Dams, Overflow Berms
						After Ice Movement	10-150	1-2	Sorbents
	Little Globe Creek	The Little Globe Crk is crossed by the pipeline (b) (7)(F), It is a small, meandering stream with dense willow banks that offer a considerable amount of resistance to flow during rain and snow melt floods, causing overbank flooding and ponding of water. The source of water for aufeis buildup in this area could come from groundwater seeping from the banks of the stream.	3 to 10 ft	10 to 30 ft	Summer	Low Flow	2-10	1-2	Booms, Underflow Dams
						Rain Floods	10-50	2-3	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	1-10	1-2	Booms, Underflow Dams
						After Ice Movement	10-50	2-3	Sorbents
	North Branch Aggie Creek	The North Branch of Aggie Crk at the pipeline crossing is a small stream that flows in a moderately broad floodplain. The dense brush along the banks offers a considerable amount of resistance in flow during rain and snow-melt floods, causing overbank flooding and ponding of water. During the initial stages of breakup, it has been observed that water flows over the ice (aufeis), eventually eating a channel into it.	3 to 5 ft	5 to 10 ft	Summer	Low Flow	2-20	0-1	Booms, Underflow Dams
						Rain Floods	20-150	1-3	Sorbents
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	2-20	0-1	Booms, Underflow Dams
						After Ice Movement	10-150	1-3	Sorbents
	South Branch Aggie Creek	The South Branch of Aggie Crk at the pipeline crossing is a small stream that flows in a moderately broad floodplain. The dense brush along the banks offers a considerable amount of resistance to flow during rain and snow-melt floods, causing overbank flooding and ponding of water. During the initial stages of breakup, it has been observed that water flows over the ice (aufeis), eventually eating a channel into it.	3 to 8 ft	8 to 15 ft	Summer	Low Flow	5-40	1-2	Booms, Underflow Dams
						Rain Floods	40-240	2-3	Sorbents
					Freezeup	Without Ice Cover	0-8	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-2	0-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	5-30	0-1	Booms, Underflow Dams
						After Ice Movement	30-240	1-3	Sorbents
	Washington Creek	At the pipeline crossing, Washington Crk flows into a single channel with some high-water channels. Dense tree cover and vegetation along the banks is a source of debris which collects in the form of log jams, particularly in high-water channels. Breakup has been observed to be gradual without much ice floating in the channel.	15 to 25 ft	25 to 40 ft	Summer	Low Flow	20-600	1-2	Booms, Underflow Dams
						Rain Floods	600-2,400	2-3	Sorbents
					Freezeup	Without Ice Cover	5-40	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	2-10	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Blocking Dams, Sorbents
					Breakup	Before Ice Movement	10-100	1-2	Booms, Underflow Dams
						After Ice Movement	100-2,400	1-3	Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Chatanika River**	The Chatan ka R, in the reach near the pipeline crossing, is characterized by an irregular, meander pattern within a broad, flat valley. Several oxbow lakes (shutoff channels) exist downstream from the pipeline which could be used advantageously during containment procedures. The Chatanika R begins to overflow its banks onto the floodplain when the discharge exceeds 4,400 cfs. It has been observed that during freezeup, ice will accumulate in the river's pools, forming a thin ice cover, whereas the riffles will remain open. During the winter, the riffles freeze solid to the riverbed, forcing intragravel flow. Aufeis has been observed in the vicinity of the pipeline during some years, but does not appear to be a regular, reoccurring phenomenon. Some of the deep pools have been observed to have a thin ice cover with a snow bridge across them during the late winter. During the initial stages of breakup, water will flow over the bed-fast ice. Little ice jamming occurs during breakup; however, the flow will often exceed the river's banks during peak flow, flooding the Chatanika R floodplain.	60 to 117 ft	117 to 2,000 ft	Summer	Low Flow	200-2,000	1-2	Diversion Booms in Series
						Rain Floods	2,000-11,000	2-4	Diversion Booms in Series
					Freezeup	Without Ice Cover	200-1,000	0-1	Diversion Booms in Series
						With Ice Cover	50-500	0-1	Diversion Booms in Series
					Winter	Under Ice Flow Aufeis Potential: High	1-100	0.5-1	Diversion, Sorbent Booms
					Breakup	Before Ice Movement	200-2,000	1-2	Diversion Booms in Series
						After Ice Movement	2,000-11,000	2-4	Diversion Booms in Series
	Goldstream Creek	Goldstream Crk, in the reach near the pipeline crossing, flows adjacent to a steep-faced slope on the north and old placer mine tailings on the south. The floodplain is narrow with trees and dense brush vegetation. A considerable amount of aufeis exist in Goldstream Crk in the vicinity of the pipeline crossing and downstream.	5 to 15 ft	15 to 100 ft	Summer	Low Flow	50-300	0.5-2	Booms, Underflow Dams
						Rain Floods	300-1,500	2-3	Sorbents
					Freezeup	Without Ice Cover	5-30	0.5-1	Underflow Dams, Blocking Dams
						With Ice Cover	2-20	0.5-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0-5	0-0.5	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-300	0.5-3	Booms, Underflow Dams
						After Ice Movement	300-1,500	2-3	Sorbents
	Steele Creek	Steele Crk at the pipeline crossing flows in a small, meandering channel that is incised in a well-vegetated, flat plain. Aufeis has been observed on this system, and at breakup flow spreads to a width of 20 to 40 ft due to an aufeis-filled channel.	5 to 10 ft	10 to 40 ft	Summer	Low Flow	2-50	0.5-1	Booms, Blocking Dams
						Rain Floods	50-500	0-1	Sorbents
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-50	0.5-1	Booms, Underflow Dams
						After Ice Movement	50-500	0-1	Sorbents
	Chena River	At the pipeline crossing, the Chena R flows in a single channel with some high-water channels. The river meanders in a wide, alluvial floodplain with trees and dense brush along the banks. The Chena R at the pipeline crossing normally freezes solid at the surface each winter; however, due to warm water effluents into the river, open water areas normally persist at the Wendell Street Bridge, Cushman Street Bridge, and the Municipal Utility Power Plant. The flow characteristics listed below do not consider the regulation of the Chena R Flood Project. The main objective of this project is to not allow the Chena R to exceed bankfull capacity, which is 12,000 cfs. During flood periods, the width of the Chena R may exceed 1 mile.	150 to 200 ft	200 to 600 ft	Summer	Low Flow	500-10,000	1-2	Diversion Booms in Series
						Rain Floods	10,000-25,000	2-4	Diversion Booms in Series
					Freezeup	Without Ice Cover	400-1,500	0-1	Diversion Booms in Series
						With Ice Cover	400-1,000	0-1	Diversion Booms in Series
					Winter	Under Ice Flow Aufeis Potential: Low	200-800	0.5-1	Diversion Booms, Sorbent Booms
					Breakup	Before Ice Movement	500-3,000	1-2	Diversion Booms in Series
						After Ice Movement	3,000-25,000	2-4	Diversion Booms in Series
	Moose Creek Nos. 3, 2, and 1	Moose Crk is crossed by the pipeline three times, at (b) (7)(F), (b) (3) Moose Crk flows in a meandering pattern that is incised in a floodplain with dense brush and tree cover along the banks. The initial stages of breakup have been observed to be relatively gentle with water flowing over ice. Because of the close proximity of Moose Crk to the Tanana R, the high water level in the Tanana that occurs during periods of high flow could cause backwater effects in Moose Crk, slowing down the velocities.	30 to 100 ft	100 to 150 ft	Summer	Low Flow	50-1,000	0-1	Booms, Underflow Dams
						Rain Floods	1,000-3,400	1-3	Sorbents
					Freezeup	Without Ice Cover	10-100	0.5-1	Underflow Dams, Blocking Dams
						With Ice Cover	10-50	0.5-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	5-50	0.5-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	50-500	0-1	Booms, Underflow Dams
						After Ice Movement	50-3,400	1-3	Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**French Creek No. 5**	French Crk No. 5 is crossed by the pipeline at (b) (7)(F). The creek is incised and meanders in a well-vegetated floodplain. T(b) (3), (b) (7)(F) .	10 to 40 ft	40 to 80 ft	Summer	Low Flow	50-800	1-2	Booms, Underflow Dams
						Rain Floods	800-2,600	1-3	Sorbents
					Freezeup	Without Ice Cover	10-80	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	5-30	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	5-20	0.5-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	50-800	1-2	Booms, Underflow Dams
						After Ice Movement	800-2,600	1-4	Sorbents
	French Creek Nos. 4, 3, 2, and 1	French Crk is crossed by the pipeline at (b) (7)(F), (b) (3) . Through this reach, the stream is an incised, single channel that meanders in a well-vegetated floodplain.	20 to 40 ft	40 to 80 ft	Summer	Low Flow	20-700	1-2	Booms, Underflow Dams
						Rain Floods	700-2,400	1-4	Sorbents
					Freezeup	Without Ice Cover	10-50	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	5-25	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	5-20	0.5-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	50-700	1-2	Booms, Underflow Dams
						After Ice Movement	700-2,400	1-4	Sorbents
	French Creek No. 0	The pipeline crosses French Crk No. 0 (b) (7)(F), . The stream is incised in a well-vegetated floodplain.	5 to 15 ft	15 to 100 ft	Summer	Low Flow	20-200	0-1	Booms, Underflow Dams
						Rain Floods	200-750	1-3	Sorbents
					Freezeup	Without Ice Cover	2-10	0.5-1	Underflow Dams, Blocking Dams
						With Ice Cover	2-5	0.5-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	2-5	0.5-1	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	20-100	0-1	Booms, Underflow Dams
						After Ice Movement	100-750	1-2	Sorbents
	Million Dollar Creek Nos. 4, 3, 2, and 1	This small creek crosses the pipeline four times, (b) (7)(F), (b) (3) The stream is incised and meanders in a well-vegetated floodplain.	4 to 15 ft	15 to 25 ft	Summer	Low Flow	20-170	0-1	Booms, Underflow Dams
						Rain Floods	170-700	1-2	Sorbents
					Freezeup	Without Ice Cover	2-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-3	0.5-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	20-100	0-1	Booms, Underflow Dams
						After Ice Movement	100-700	1-2	Sorbents
	(b) (7)(F), (b) (3)	This intermittent stream flows sluggishly in a poorly defined course through dense vegetation. The water is often ponded with little or no velocity. Some incised channels do exist downstream of the pipeline crossing.	5 to 15 ft	10 to 30 ft	Summer	Low Flow	0-10	0-1	Blocking Dams, Underflow Dams
						Rain Floods	10-60	1-2	Overflow Berms
					Freezeup	Without Ice Cover	0-10	0-1	Trenches, Blocking Dams
						With Ice Cover	0-5	0-1	Underflow Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Trenches, Snow Berms
					Breakup	Before Ice Movement	0-10	0-1	Blocking Dams, Underflow Dams
						After Ice Movement	10-60	1-2	Overflow Berms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Little Salcha River**	At the pipeline crossing, the Little Salcha R flows in a single-channel and meandering pattern. The riverbanks are steep and well-vegetated; slumping of the banks provides debris into the river which jams occasionally. The floodplain is wide, but heavily vegetated. The river flows in a pool and riffle sequence during low flow. Slower velocities will occur in the pools that exist on the outside of meanders. During breakup, the snowmelt water will flow over the ice and eventually melt a channel through the ice. The ice will then begin to lift up and accumulate in the slow velocity areas.	15 to 35 ft	30 to 50 ft	Summer	Low Flow	20-200	1-2	Underflow Dams, Booms
						Rain Floods	200-1,200	1-3	Diversion Booms
					Freezeup	Without Ice Cover	20-150	1-2	Underflow Dams, Diversion Booms
						With Ice Cover	5-40	0.5-1	
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Blocking Dams, Trenches
					Breakup	Before Ice Movement	20-200	1-2	Underflow Dams, Booms
						After Ice Movement	200-1,200	1-3	Diversion Booms
	Stream at PLMP (b)	This incised stream has steep banks up to five ft. The banks are well-vegetated and the vegetation mat and some trees overhang into the channel. Several ponds exist with velocities less than 1 fps due to the high amount of debris in the channel.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	10-40	0.5-1	Underflow Dams, Boom
						Rain Floods	40-250	1-2	Overflow Berms
					Freezeup	Without Ice Cover	2-10	0.5-1	Underflow Dams, Overflow Berms
						With Ice Cover	0-2	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Snow Berms
					Breakup	Before Ice Movement	10-40	0.5-1	Underflow Dams, Boom
						After Ice Movement	40-250	1-2	Overflow Berms
	Salcha River	The Salcha R flows in a meandering pattern with a split channel formation. The river's floodplain averages 4,000 ft in width and is well-covered with trees and brush. Several high-water channels that flow only during floods exist downstream from the pipeline crossing, which could be used advantageously during containment procedures. During the summer period, the average velocity is 3 to 4 fps with slower velocities existing in the pools and higher velocities in the straight sections. The Salcha R flow rate responds fairly quickly to rainstorms; therefore, fluctuations in velocities can be expected. When the river floods to near bankfull capacity, the velocities can reach 9 fps and the flow will be quite turbulent. During the freezeup process, slush ice will flow in the channel for 2 to 5 days before it accumulates and forms an ice cover in the slow velocity areas. During the winter, open water areas often exist just upstream and downstream from the Richardson Hwy Bridge. During the breakup period, the increased flow will lift the ice cover, leaving open water leads along the banks. After about two weeks, the ice will break up and begin to flow. Ice jams will often form at the Richardson Hwy Bridge, lasting about one day. After the ice run begins, the river will be mostly ice free after one week. Unless a heavy rainstorm accompanies breakup, the Salcha R seldom floods its banks during the breakup period.	300 to 800 ft	800 to 4,000 ft	Summer	Low Flow	1,000-5,000	1-3	Diversion Booms in Series
						Rain Floods	5,000-25,000	2-6	
					Freezeup	Without Ice Cover	300-1,000	1-2	Diversion Booms in Series
						With Ice Cover	100-400	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	50-400	0-1	Booms, Underflow Dams
					Breakup	Before Ice Movement	400-5,000	1-3	Diversion Booms in Series
						After Ice Movement	500-25,000	2-6	
	Redmond Creek	Redmond Crk flows in a meandering pattern within a moderately wide floodplain. The banks are steep with a dense growth of grasses and brush that grow down to the normal water level. The floodplain is heavily wooded and several oxbow lakes (cutoff channels) exist that could be used advantageously during containment procedures. Breakup has been observed to be gradual buildup of flow over ice with the water eating a channel into the ice.	25 to 35 ft	35 to 60 ft	Summer	Low Flow	20-400	1-2	Diversion Booms, Diversion Berms
						Rain Floods	400-2,000	1-3	Booms
					Freezeup	Without Ice Cover	20-80	0-1	Underflow Dams, Diversion Berms
						With Ice Cover	2-20	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	1-5	0-1	Trenches, Snow Berms
					Breakup	Before Ice Movement	40-400	1-2	Diversion Booms, Diversion Berms
						After Ice Movement	400-2,000	1-3	Booms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Unnamed Creek**	This intermittent stream flows in a narrow channel that meanders irregularly in a floodplain covered with a dense growth of grass and willows.	2 to 10 ft	10 to 25 ft	Summer	Low Flow	0-10	0-1	Blocking Dams, Underflow Dams
						Rain Floods	10-40	1-2	Overflow Berms
					Freezeup	Without Ice Cover	0-5	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-2	0-1	Overflow Berms
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches
					Breakup	Before Ice Movement	2-10	0-1	Blocking Dams, Underflow Dams
						After Ice Movement	10-40	1-2	Overflow Berms
	Gold Run Creek	This intermittent stream flows in a narrow channel that meanders irregularly in a floodplain covered with a dense growth of grass and willows. This stream has been observed to have major aufeis at the pipeline crossing during the winter. Breakup is normally gentle with the water eating a channel into the ice.	2 to 10 ft	10 to 25 ft	Summer	Low Flow	3-10	0-1	Blocking Dams, Underflow Dams
						Rain Floods	10-50	1-2	Overflow Berms
					Freezeup	Without Ice Cover	0-10	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-5	0-1	Overflow Berms
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches
					Breakup	Before Ice Movement	0-10	0-1	Blocking Dams, Underflow Dams
						After Ice Movement	10-60	1-2	Overflow Berms
	Minton Creek	Minton Crk is an incised stream that flows in a floodplain covered with a dense growth of grass and willows. This stream (including north fork and south fork) has severe aufeising that completely fills most of the channel and will grow in the floodplain. During the initial stages of breakup, flow will spread out over the ice, eventually eating a channel into it.	5 to 15 ft	10 to 20 ft	Summer	Low Flow	5-20	0-2	Blocking Dams, Underflow Dams
						Rain Floods	20-150	1-2	Overflow Berms
					Freezeup	Without Ice Cover	0-10	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-5	0-1	Overflow Berms
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches
					Breakup	Before Ice Movement	5-20	0-2	Blocking Dams, Underflow Dams
						After Ice Movement	20-150	1-3	Overflow Berms
	Rosa Creek	Rosa Crk headwaters parallel the pipeline. This area has heavy aufeis in the channels and it may overflow onto the floodplain. During the initial stages of breakup, water will flow over the ice, eventually eating a channel into it.	3 to 10 ft	10 to 15 ft	Summer	Low Flow	1-5	0-1	Underflow Dams, Overflow Berms
						Rain Floods	5-20	1-2	
					Freezeup	Without Ice Cover	1-2	0.5-1	Underflow Dams, Overflow Berms
						With Ice Cover	0-1	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Snow Berms
					Breakup	Before Ice Movement	1-5	0-1	Underflow Dams, Overflow Berms
						After Ice Movement	5-15	1-2	
	Rosa Creek	Rosa Crk is a tributary to Shaw Crk and the pipeline crossing is approximately 1,200 ft upstream of its confluence. This creek is incised within the silt of Shaw Crk Flats. The channel is debris choked from the dense vegetation that exists along its banks.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-20	0.5-1	Underflow Dams
						Rain Floods	20-100	1-2	Overflow Berms
					Freezeup	Without Ice Cover	0-10	0-1	Underflow Dams, Overflow Berms
						With Ice Cover	0-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Trenches, Snow Berms
					Breakup	Before Ice Movement	2-20	0.5-1	Underflow Dams, Overflow Berms
						After Ice Movement	2-200	1-2	

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Shaw Creek**	Shaw Crk meanders irregularly and is incised (riverbed to the top of bank is about 15 ft) in a relatively narrow floodplain. The banks and floodplain are well-vegetated with grass, brush and trees which offer a source of floating debris during flood events. The river's gradient is relatively gentle downstream from the pipeline crossing and backwater from the Tanana R may reduce velocities during flood events.	50 to 75 ft	75 to 100 ft	Summer	Low Flow	100-1,500	1-2	Booms
						Rain Floods	1,500-7,000	1-2	
					Freezeup	Without Ice Cover	50-300	1-2	Underflow Dams
						With Ice Cover	10-50	0.5-1	
					Winter	Under Ice Flow Aufeis Potential: Low	3-10		Underflow Dams
					Breakup	Before Ice Movement	50-300	1-2	Booms
						After Ice Movement	300-700	1-2	
	Tanana River	At the pipeline crossing, the Tanana R is incised with a narrow floodplain. Downstream, the Richardson Hwy Bridge confines it to a single channel and directs it toward the big bluff on the north bank where a whirlpool exists. The whirlpool would probably retain some oil (in case of a spill into the Tanana) allowing partial removal. After the Tanana-Delta R confluence, the Tanana R abruptly changes to a braided river pattern, with several channels separated by gravel bars and vegetated islands. If oil enters the Tanana R, containment would be carried out in the braided portion of the river. The Tanana R has a steep gradient and high velocities even during the Summer normal flow period. Velocities above 3 fps can be expected in the main channels and also the side channels. During the freezeup period, slush ice will flow causing slight and short term jamming before an ice cover begins to form. The smaller channels will eventually freeze to the bed, forcing flow into one or two of the main channels. Open water leads will persist into midwinter, especially along the south bank at the pipeline crossing and at the Tanana-Delta R confluence. It is common for slush ice (porous ice that allows flow through it) to accumulate beneath the solid ice cover which would probably retain some of the oil if it were to flow beneath the ice cover. During breakup, the increased flow lifts the ice cover and breaks up the ice in the main channels that had flowing water throughout the winter first. Water will flow over the ice in the small channels that were frozen to the bed. Due to the high velocities and flowing ice, containment would be extremely difficult during breakup.	200 to 1,000 ft	1,000 to 4,000 ft	Summer	Low Flow	15,000-30,000	2-5	Diversion Booms with Underflow Dams in Small Channels
						Rain Floods	30,000-60,000	3-7	
					Freezeup	Without Ice Cover	8,000-15,000	1-4	Same as Above
						With Ice Cover	10,000-50,000	1-2	
					Winter	Under Ice Flow Aufeis Potential: High	2,000-5,000	1-2	Diversion Booms with Underflow Dams in Small Channels, Trenches at Intragravel Flow and Aufeis Areas
					Breakup	Before Ice Movement	5,000-20,000	1-3	Diversion Booms with Underflow Dams in Small Channels
						After Ice Movement	20,000-50,000	3-7	
	Jarvis Creek	Just downstream from the pipeline crossing, the Richardson Hwy Bridge confines Jarvis Crk to a relatively narrow, single channel. After the bridge, the stream fans out into its natural braided pattern and maintains it to the Delta R confluence, 4,000 ft downstream from the pipeline crossing. Total containment in Jarvis Crk will probably not be possible during the open water seasons because of the short distance to the Delta R confluence and the high velocities in Jarvis Crk. However, emphasis should be directed towards maximizing containment in Jarvis Crk because containment difficulties increase in the Delta R and subsequently downstream in the Tanana R. During summer, freezeup, and breakup, the most practical method of at least partial containment in this high velocity stream would be diversion booming to existing high water channels or man-made channels with low flow in them, then separating the oil and water using dams with underflow water bypass systems. This containment method could be employed in the wide gravel floodplain downstream from the bridge.	50 to 200 ft	200 to 1,000 ft	Summer	Low Flow	20-1,000	1-2	Diversion Booms with Underflow Dams in Small Channels
						Rain Floods	1,000-6,500	2-4	
					Freezeup	Without Ice Cover	20-80	1-2	Same as Above
						With Ice Cover	5-20	0.5-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Trenches, Underflow Dams
					Breakup	Before Ice Movement	20-1,000	1-3	Diversion Booms with Underflow Dams in Small Channels
						After Ice Movement	1,000-6,500	2-4	
	Unnamed Stream (b) (7)(F), (b) (3)	This intermittent stream flows in a muskeg, well-vegetated floodplain. The water is often pooled along the channel's course.	1 to 5 ft	4 to 20 ft	Summer	Low Flow	0-5	0-1	Blocking Dams, Underflow Dams
						Rain Floods	5-20	0.5-1	Culvert Blocking
					Freezeup	Without Ice Cover	0-5	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-2	0-0.5	Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Snow Berms, Trenches
					Breakup	Before Ice Movement	1-5	0.5-1	Blocking Dams, Underflow Dams
						After Ice Movement	5-20	0.5-1	Same

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		This intermittent stream flows in a narrow floodplain that is well-vegetated with brush and trees.	1 to 5 ft	4 to 10 ft	Summer	Low Flow	0-5	0-1	Blocking Dams, Underflow Dams
						Rain Floods	5-20	0-1	Culvert Blocking
					Freezeup	Without Ice Cover	0-5	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-2	0-0.5	Culvert Blocking
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Snow Berms, Trenches
					Breakup	Before Ice Movement	1-5	0.5-1	Blocking Dams, Underflow Dams
						After Ice Movement	5-20	0.5-1	Culvert Blocking
		This mountainous, incised stream has considerable brush and trees along its banks. The bed consists of boulders and cobbles and the stream flows in a pool and riffle sequence.	2 to 7 ft	5 to 20 ft	Summer	Low Flow	0-15	0.5-1	Underflow Dams, Overflow Berms
						Rain Floods	15-30	1-2	Same
					Freezeup	Without Ice Cover	0-5	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-2	0-1	Trenches
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Snow Berms, Trenches
					Breakup	Before Ice Movement	1-15	0.5-1	Underflow Dams, Overflow Berms
						After Ice Movement	15-30	1-2	Same
		This stream flows intermittently in a muskeg-type channel. The floodplain is hummocky and pools the water in several locations. The dense vegetation will offer resistance to the flow of water and oil.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-20	0.5-1	Blocking Dams, Underflow Dams
						Rain Floods	20-40	0-1	Overflow Berms
					Freezeup	Without Ice Cover	0-5	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-2	0-1	Trenching
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Trenching, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	2-20	0.5-1	Blocking Dams, Underflow Dams
						After Ice Movement	20-40	0-1	Overflow Berms
(b) (7)(F), (b) (3)	**Ruby Creek**	At the pipeline crossing, Ruby Crk flows in an incised, meandering pattern with dense brush and trees along the banks. About 1,000 ft downstream from the pipeline crossing, the creek fans out into a braided pattern with a side gravel floodplain, which offers gravel materials for containment procedures. The braided pattern is maintained until about 1,000 ft downstream of the Richardson Hwy Bridge where it again flows in an incised, meandering pattern.	10 to 20 ft	15 to 35 ft	Summer	Low Flow	5-50	1-2	Underflow Dam, Diversion Booms With Pits
						Rain Floods	50-200	2-5	Same
					Freezeup	Without Ice Cover	2-40	1-2	Underflow Dam, Overflow Berms
						With Ice Cover	0-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-0.5	Blocking Dams, Trenches, Underflow Dams
					Breakup	Before Ice Movement	5-50	1-2	Underflow Dam, Diversion Booms With Pits
						After Ice Movement	50-500	2-5	Same
–	**Delta River**	The Delta R flows in a braided pattern with several channels dividing and uniting, separated by gravel bars and islands. The channels will often change their courses rapidly during flood events, thus the channel locations may be different than the way they appear on aerial photography. However, the general characteristics of the river will remain the same. The Delta R floodplain offers a plentiful supply of gravel materials that could be used during containment procedures. The floodplain gravels are highly permeable; therefore, containment pits should be lined to prevent oil from permeating the gravels. This steep gradient river develops velocities greater than 3 fps in most of the sub-channels during the summer. Often velocities will exceed 5 fps, which precludes the ability of effectively conducting containment procedures. Modification of the channels (using gravel floodplain material) by diverting subchannel flow and/or slowing velocities by widening and deepening the channel may be required			Summer	Low Flow	1,000-5,000	2-5	Diversion Boom into Floodplain Containment Pits
						Rain Floods	5,000-15,000	3-7	In Subchannels, Diversion Booms and Underflow Dams
					Freezeup	Without Ice Cover	25-1,200	1-4	Diversion Boom with Pits
						With Ice Cover	5-50	0.5-1	Underflow Dams, Gravel Berms
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Trenches, Underflow Dams, Containment Pits
					Breakup	Before Ice Movement	50-1,200	1-3	Diversion Boom into Floodplain Containment Pits

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
		to enable diversion booming of the oil to a containment pit. Since the pipeline parallels the east bank of the Delta R, the oil will initially flow on the east floodplain and in the east sub-channels. Containment procedures should keep the oil out of the central, major channels. During freezeup, flows and velocities will progressively decrease as ice begins to form and flow in the channels. The smaller sub-channels will freeze up and cease flow first. Flowing ice in the major channels can jam, backing water and ice upstream. During the winter, continuous flow in the channels down the Delta R ceases. However, spring seepage can maintain open water pockets; the water will eventually build large aufeis deposits and/or seep back into the gravel bed materials as intragravel flow. During breakup, water will initially flow over the ice and melt channels through the bed-fast ice. As flow increases, the ice-bounded channel dimensions will increase, eventually melting the ice away. Some ice chunks will calve off and flow in the channels; but, generally, ice jams do not occur. Flow fluctuations are largely dependent on rainstorm events. During floods, velocities will probably be higher than 5 fps in the major channels.				After Ice Movement	600-10,000	2-7	In Subchannels, Diversion Booms and Underflow Dams
(b) (7)(F), (b) (3)	**Bear Creek**	Downstream from the pipeline crossing, Bear Crk fans out into the Delta R terrace, then meanders through the spruce-vegetated terrace before entering the Delta R. Containment should be executed before oil reaches the Delta R. During floods, flow will be dispersed into several channels.	10 to 20 ft	20 to 40 ft	Summer	Low Flow	10-50	1-3	Diversion Booms with Pits
						Rain Floods	50-600	2-7	Underflow Dams
					Freezeup	Without Ice Cover	0-2	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	10-50	1-3	Diversion Berms with Pits
						After Ice Movement	50-500	2-7	Underflow Dams
	Unnamed Stream (b) (7)(F), (b) (3)	This meandering stream is incised with well-vegetated banks. It crosses the pipeline at (b) (7)(F), and then parallels the workpad northerly to (b) (7) 9 where it turns westerly. Because the gradient on this stream is relatively gentle, containment procedures may be possible during rain floods and breakup.	5 to 15 ft	15 to 30 ft	Summer	Low Flow	2-20	0-1	Underflow Dams, Diversion Booms with Pits
						Rain Floods	20-100	1-4	Same
					Freezeup	Without Ice Cover	0-5	0-1	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Trenches
					Breakup	Before Ice Movement	2-20	0-1	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	20-100	1-3	Same
	Darling Creek	At the pipeline crossing, Darling Crk flows in a braided pattern and changes to an alluvial fan 900 ft downstream from the crossing. The alluvial fan extends about 800 ft before it enters the Delta R floodplain. At all locations there is a plentiful supply of gravel materials available for containment procedures. During the summer, this steep gradient river flows predominantly as riffles. The mountainous watershed leads to flash floods during rainstorm events. During freezeup, the flow in the stream will decrease rapidly as ice begins to form, and eventually intragravel flow will prevail. Breakup will begin with snow-melt eroding a channel through the ice and snow. During rain floods and peak discharges during breakup, containment of oil in the main channels will be extremely difficult.	10 to 25 ft	20 to 80 ft	Summer	Low Flow	10-120	1-3	Diversion Booms with Pits
						Rain Floods	120-1,400	2-7	Underflow Dams
					Freezeup	Without Ice Cover	5-20	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	2-20	1-2	
					Winter	Under Ice Flow Aufeis Potential: High		0-0.5	Trenches, Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-20	1-2	Diversion Berms with Pits
						After Ice Movement	120-800	2-5	Underflow Dams

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	(b) (7)(F), (b) (3)	This intermittent stream flows in a single, incised channel. The banks are well-vegetated and offer a source of debris into the stream. The gradient is steep and the stream is subject to flash floods during rainstorms.	2 to 10 ft	10 to 20 ft	Summer	Low Flow	0-20	0-3	Blocking Dams, Underflow Dams
						Rain Floods	20-80	2-4	Same
					Freezeup	Without Ice Cover	0-5	0-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-1	0-1	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Trenches, Snow Berms
					Breakup	Before Ice Movement	2-20	1-2	Diversion Berms, Underflow Dams
						After Ice Movement	10-80	2-3	Booms, Same
		Downstream from the pipeline crossing, this intermittent stream flows through a spruce forest floodplain. During low flow periods, a defined channel is present; but during floods, water will flow in several channels before being channelized at the Richardson Hwy. This stream is subject to flash floods during rainstorms.	2 to 10 ft	5 to 20 ft	Summer	Low Flow	0-40	0-3	Diversion Booms with Pits
						Rain Floods	40-180	2-4	Underflow Dams
					Freezeup	Without Ice Cover	1-10	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	0-2	0-1	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	2-20	1-2	Diversion Berms with Pits
						After Ice Movement	20-150	2-4	Underflow Dams
	One Mile Creek	At the pipeline crossing, One Mile Crk flows on an alluvial fan. Downstream, the Richardson Hwy Bridge has channelized the flow into the northern channel. Flow can be expected in any of the several channels, especially during flooding. This steep gradient stream will make containment operations extremely difficult during peak flooding.	10 to 20 ft	20 to 50 ft	Summer	Low Flow	5-80	2-5	Underflow Dams, Diversion Booms
						Rain Floods	60-270	4-8	Same
					Freezeup	Without Ice Cover	2-10	1-3	Underflow Dams Blocking Dams
						With Ice Cover	0-5	0-2	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	5-80	2-5	Underflow Dams, Diversion Berms
						After Ice Movement	60-270	4-8	Booms, Same
	Gunnysack Creek	Downstream of the pipeline crossing, Gunnysack Crk flows 1,000 ft before passing underneath the Richardson Hwy and then fanning out into the Delta R. A spill would probably reach the Delta R floodplain before containment procedures could be employed; however, partial containment on the alluvial fan could be accomplished. Containment during rain floods and peak discharges during breakup will be extremely difficult in the main channel.	10 to 30 ft	20 to 50 ft	Summer	Low Flow	10-80	1-3	Diversion Booms with Pits
						Rain Floods	80-370	2-5	Diversion Berms, Underflow Dams
					Freezeup	Without Ice Cover	5-30	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	0-5	0-1	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	10-80	1-3	Diversion Booms with Pits
						After Ice Movement	80-370	2-5	Diversion Berms, Underflow Dams
	Falls Creek	Downstream of the pipeline crossing, Falls Crk goes over a waterfall and then flows about 800 ft before entering Delta R. Complete containment within this creek before it enters the Delta R may not be possible, but partial containment at the bridge should be employed, especially during low flow and winter periods.	10 to 20 ft	20 to 40 ft	Summer	Low Flow	5-50	1-3	Diversion Booms with Pits
						Rain Floods	50-200	2-5	Underflow Dams
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	0-5	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	5-50	1-3	Diversion Booms with Pits
						After Ice Movement	50-150	2-4	Underflow Dams

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Suzy Q Creek**	Downstream of the pipeline crossing, Suzy Q Crk flows rapidly into the Delta R, 500 ft away. Total containment within Suzy Q will not be possible during open water seasons. However, partial containment on the fan where it just enters the Delta R would be possible. During rainstorm floods and at peak discharges during breakup, containment in the main channel will be extremely difficult.	10 to 20 ft	20 to 40 ft	Summer	Low Flow	2-40	1-3	Diversion Booms, Containment Pits
						Rain Floods	40-500	2-8	Underflow Dams
					Freezeup	Without Ice Cover	0-10	0-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	2-40	1-3	Diversion Booms and Pits
						After Ice Movement	40-500	2-8	Underflow Dams
	Lower Suzy Q Creek	Downstream from the pipeline crossing, Lower Suzy Q Crk flows rapidly into the Delta R, 500 ft away. Total containment within Lower Suzy Q Crk will not be possible during open water seasons. However, partial containment would be poss ble on the fan where it enters the Delta R. During rainstorm floods and peak discharges during breakup, containment in the main channel will be extremely difficult.	2 to 10 ft	10 to 20 ft	Summer	Low Flow	0-20	1-2	Diversion Booms with Pits
						Rain Floods	20-150	2-5	Underflow Dams, Diversion Berms
					Freezeup	Without Ice Cover	0-5	1-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-2	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	2-20	1-3	Diversion Booms with Pits
						After Ice Movement	20-150	2-5	Underflow Dams, Diversion Berms
	Boulder Creek	Downstream from the pipeline crossing, Boulder Crk flows rapidly into the Delta R, 1,000 ft away. Total containment within Boulder Crk will not be possible during open water seasons. However, partial containment on the fan, where it just enters the Delta R, would be possible. During rainstorm floods and at peak discharges during breakup, containment in the main channel will be extremely difficult.	5 to 12 ft	10 to 25 ft	Summer	Low Flow	5-100	1-3	Diversion Booms with Pits
						Rain Floods	100-1,000	2-8	Underflow Dams, Diversion Berms
					Freezeup	Without Ice Cover	0-15	0-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	2-5	0-1	Trenches, Snow Berms, Blocking Dams
					Breakup	Before Ice Movement	10-100	1-3	Diversion Booms with Pits
						After Ice Movement	100-1,000	2-8	Underflow Dams, Diversion Berms
	Whistler Creek	Immediately downstream of the pipeline crossing, Whistler Crk fans out into the Delta R floodplain. Total containment within Whistler Crk will not be possible during open water seasons. However, partial containment would be possible on the fan just before it enters the Delta R. During rainstorm floods and at peak discharges during breakup, containment in the main channel will be extremely difficult.	10 to 15 ft	15 to 40 ft	Summer	Low Flow	5-60	1-3	Underflow Dams, Diversion Booms and Pits
						Rain Floods	60-900	2-8	Diversion Booms and Pits
					Freezeup	Without Ice Cover	20	0-2	Underflow Dams, Diversion Booms and Pits
						With Ice Cover	0-5	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	2-40	1-2	Underflow Dams, Diversion Booms and Pits
						After Ice Movement	40-500	2-6	Same
	Flood Creek	Immediately downstream of the pipeline crossing, Flood Crk fans out into the Delta R floodplain. Total containment within Flood Crk will not be possible during open water seasons. However, partial containment would be possible on the fan just before it enters the Delta R. During rainstorm floods and at peak discharges during breakup, containment in the main channel will be extremely difficult.	10 to 15 ft	15 to 40 ft	Summer	Low Flow	5-60	1-3	Underflow Dams, Diversion Booms and Pits
						Rain Floods	60-600		Same
					Freezeup	Without Ice Cover	2-200	1-2	Underflow Dams, Blocking Dams
						With Ice Cover	0-5	0-1	Diversion Booms and Pits
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	2-40	1-2	Underflow Dams, Diversion Booms and Pits
						After Ice Movement	40-400	2-5	Same

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Michael Creek**	Immediately downstream of the pipeline crossing, Michael Crk fans out into the Delta R floodplain. Total containment within Michael Crk will not be possible during open water seasons. However, partial containment would be poss ble on the fan just before it enters the Delta R. During rainstorm floods and at breakup peak discharges, containment in the main channel will be extremely difficult.	10 to 20 ft	20 to 50 ft	Summer	Low Flow	5-60	1-3	Underflow Dams, Diversion Booms and Pits
						Rain Floods	60-800	2-7	Same
					Freezeup	Without Ice Cover	0-20	0-2	Underflow Dams, Diversion Booms and Pits
						With Ice Cover	0-5	0-1	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	2-40	1-2	Underflow Dams, Diversion Booms and Pits
						After Ice Movement	40-500	2-4	Same
	Trim's Creek	Immediately downstream of the pipeline crossing, Trim's Crk fans out into the Delta R floodplain. Total containment within Trim's Crk will not be poss ble during open water seasons. However, within the Delta R floodplain, containment will be possible before it enters the main channel of the Delta R. During rainstorm floods and breakup peak discharges, containment in the main channel will be extremely difficult.	15 to 25 ft	25 to 50 ft	Summer	Low Flow	20-120	1-5	Underflow Dams, Diversion Booms and Pits
						Rain Floods	120-1,000	1-8	Same
					Freezeup	Without Ice Cover	5-20	1-2	Underflow Dams, Diversion Booms and Pits
						With Ice Cover	0-10	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Trenches, Snow Berms
					Breakup	Before Ice Movement	2-80	1-2	Underflow Dams, Diversion Booms and Pits
						After Ice Movement	50-600	2-4	Same
	Castner Creek	Castner Crk flows from Castner Crk Glacier, which is about 1 mile upstream of the pipeline crossing. The flow fans out into the Delta R, 3,000 ft downstream. Glacial melt will largely govern the flow in this creek; diurnal fluctuations can be expected during warm Summer periods. During freezeup and early winter, flow will persist longer than streams not glacial fed; this flow of water will build large aufeis fields. During breakup, the increased flow will eat a channel through the aufeis. The stream's seasonal velocities will make containment procedures extremely difficult. Containment procedures should take advantage of the wide, gravel floodplain materials.	50 to 100 ft	100 to 200 ft	Summer	Low Flow	100-1,000	1-4	Diversion Booms and Pits
						Rain Floods	1,000-2,100	3-8	Same
					Freezeup	Without Ice Cover	20-100	1-3	Diversion Booms and Pits
						With Ice Cover	5-30	1-2	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Trenching, Blocking Dams
					Breakup	Before Ice Movement	100-500	1-3	Diversion Booms and Pits
						After Ice Movement	500-1,500	2-7	Same
	wer Miller Creek	Lower Miller Crk flows from Fels Glacier, which is about 2 miles upstream of the pipeline crossing. The flow fans out into the Delta R, 3,000 ft downstream. Glacial melt will largely govern the flow in this creek; diurnal fluctuations can be expected during warm summer periods. During freezeup and early winter, flow will persist longer than streams not glacial fed; this flow of water will build large aufeis fields. During breakup, the increased flow will eat a channel through the aufeis. During open water periods, this steep gradient stream flows at high velocities which will make containment procedures extremely difficult. Containment procedures should take advantage of the wide, gravel floodplain materials.	50 to 100 ft	100 to 200 ft	Summer	Low Flow	100-800	1-4	Diversion Booms and Pits
						Rain Floods	800-2,000	3-8	Same
					Freezeup	Without Ice Cover	10-80	1-3	Diversion Booms and Pits
						With Ice Cover	5-30	1-2	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Trenching, Blocking Dams
					Breakup	Before Ice Movement	100-400	1-3	Diversion Booms and Pits
						After Ice Movement	400-1,200	2-7	Same
	Miller Creek	Miller Crk flows from Canwell Glacier, which is about 2 miles upstream of the pipeline crossing. The flow fans out into the Delta R, 3,000 ft downstream. Glacial melt will largely govern the flow in this creek; diurnal fluctuations can be expected during warm Summer periods. During freezeup and early winter, flow will persist longer than streams not glacial fed; this flow of water will build large aufeis fields. During breakup, the increased flow will eat a channel through the aufeis. During open water periods, this steep gradient stream flows at high velocities, which will make containment procedures extremely difficult. Containment procedures should take advantage of the wide, gravel floodplain materials.	50 to 100 ft	100 to 200 ft	Summer	Low Flow	100-1,000	1-4	Diversion Booms and Pits
						Rain Floods	1,000-2,200	3-8	Same
					Freezeup	Without Ice Cover	20-100	1-3	Diversion Booms and Pits
						With Ice Cover	5-30	1-2	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Trenching, Blocking Dams
					Breakup	Before Ice Movement	100-500	1-3	Diversion Booms and Pits
						After Ice Movement	500-1,500	2-7	Same

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Phelan Creek No. 3 Crossing**	At the pipeline crossing (Phelan No. 3), Phelan Crk flows in a braided pattern that fans out into the Delta R, 800 ft downstream. The multiple channels flow through a wide, gravel floodplain that could be used advantageously during containment procedures. During the summer, flow characteristics are affected by glacial melts; peak flows occur during warm, dry periods as well as following rainstorms. Flow decreases rapidly at freezeup, but persists throughout the winter. The winter flow builds large aufeis fields in Phelan Crk and Delta R.	20 to 120 ft	50 to 100 ft	Summer	Low Flow	200-800	2-4	Diversion Booms and Pits
						Rain Floods	800-2,200	2-8	Underflow Dams in Subchannels
					Freezeup	Without Ice Cover	10-50	1-2	Diversion Booms and Pits
						With Ice Cover	5-10	0-1	Underflow Dams
					Winter	Under Ice Flow Aufeis Potential: High	1-5	0-1	Underflow Dams, Trenching
					Breakup	Before Ice Movement	10-200	2-3	Diversion Booms and Pits
						After Ice Movement	200-1,000	2-7	Underflow Dams in Subchannels
	Phelan Creek No. 2 Crossing	At the pipeline crossing (Phelan Crk No. 2), Phelan Crk flows in a braided pattern. The multiple channels are separated by numerous gravel bars. The plentiful supply of gravel could be used advantageously for building containment structures, diverting the flow and ponding water to slow velocities. During the summer, flow characteristics are affected by glacial melts; peak flows could occur during warm, dry periods as well as following rainstorms. Flow decreases rapidly at freezeup, but some flow from the glacier will persist throughout the winter. The winter flow will build large aufeis fields in Phelan Crk that could exceed depths of 6 ft. An oil spill in the belowground portion of the pipeline could flow in the gravel beneath the ice for a considerable distance without being visible on the surface. However, an open channel will normally persist during the winter, which could intercept the flow of oil. During breakup, flow in Phelan Crk builds up gradually and cuts a channel through the ice with little or no floating ice and debris.	20 to 120 ft	50 to 500 ft	Summer	Low Flow	100-800	2-3	Diversion Booms and Pits
						Rain Floods	800-2,200	2-8	Underflow Dams in Side Channels
					Freezeup	Without Ice Cover	10-50	1-2	Diversion Booms and Pits
						With Ice Cover	5-10	0-1	Underflow Dams, Trenches
					Winter	Under Ice Flow Aufeis Potential: High	1-5	0-1	Underflow Dams, Trenches
					Breakup	Before Ice Movement	10-200	2-3	Diversion Booms and Pits
						After Ice Movement	200-1,000	2-8	Underflow Dams in Side Channels
	McCallum Creek	The pipeline crosses McCallum Crk where it fans out into the Phelan Crk floodplain. The plentiful supply of gravel in the Phelan Crk floodplain could be used advantageously for building containment structures, diverting the flow and ponding water to slow velocities. During the summer, flow characteristics are affected by glacial melts; peak flows could occur during warm, dry periods as well as following rainstorms. Flow decreases rapidly during freezeup, but the continuous flow during early winter will build large aufeis fields in McCallum Crk and on the Phelan floodplain. An oil spill in the belowground portion of the pipeline could flow in the gravel beneath the ice for a considerable distance without being visible on the surface. During breakup, flow in McCallum Crk builds up gradually and cuts a channel through the ice with little or no floating ice and debris.	20 to 50 ft	50 to 100 ft	Summer	Low Flow	30-300	1-3	Diversion Booms and Pits
						Rain Floods	300-2,000	3-8	Underflow Dams
					Freezeup	Without Ice Cover	20-100	1-3	Underflow Dams, Diversion Booms and Pits
						With Ice Cover	5-30	1-2	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: High	0-10	0-1	Underflow Dams, Trenches, Blocking Dams
					Breakup	Before Ice Movement	50-200	1-3	Diversion Booms and Pits
						After Ice Movement	200-1,500	2-7	Same
	Phelan Creek No. 1 Crossing	At the pipeline crossing (Phelan Crk No. 1), Phelan Crk flows in a single, confined channel; but, 1,500 ft downstream, it fans out into a braided pattern. The plentiful supply of gravel could be used advantageously for building containment structures, diverting the flow and ponding water to slow velocities. During the summer, flow characteristics are affected by glacial melts; peak flows could occur during warm, dry periods as well as following rainstorms. Flow decreases rapidly at freezeup, but some flow from the glacier will persist throughout the winter. The winter flow will build large aufeis fields in Phelan Crk that could exceed depths of 6 ft. An oil spill in the belowground portion of the pipeline could flow in the gravel beneath the ice for a considerable distance without being visible on the surface. However, an open channel will normally persist into the winter, which could intercept the flow of oil. During breakup, flow in Phelan Crk builds up gradually and cuts a channel through the ice with little or no floating ice and debris.	30 to 120 ft	50 to 500 ft	Summer	Low Flow	50-300	2-3	Diversion Booms and Pits
						Rain Floods	300-1,200	2-7	Underflow Dams in Side Channels
					Freezeup	Without Ice Cover	10-20	1-2	Diversion Booms and Pits
						With Ice Cover	5-10	0-1	Underflow Dams, Trenches
					Winter	Under Ice Flow Aufeis Potential: High	1-5	0-1	Underflow Dams, Trenches
					Breakup	Before Ice Movement	10-200	2-3	Diversion Booms and Pits
						After Ice Movement	200-1,000	2-7	Underflow Dams in Side Channels
	Dann Creek	Dann Crk flows in an incised channel within a floodplain that is covered by brush and grass. This creek passes through a series of beaver dams, upstream of the pipeline crossing, that regulate the flow and velocities. During freezeup, flow will decrease rapidly and should nearly cease by winter. Dann Crk flows into the Upper Gu kana R approximately 3,000 ft downstream of its pipeline crossing.	3 to 8 ft	8 to 15 ft	Summer	Low Flow	3-15	1-2	Underflow Dams
						Rain Floods	15-50	1-3	Diversion Berms, Booms
					Freezeup	Without Ice Cover	2-10	1-2	Underflow Dams
						With Ice Cover	1-3	0-1	Booms
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams
					Breakup	Before Ice Movement	3-15	1-2	Underflow Dams
						After Ice Movement	15-60	2-3	Diversion Berms, Booms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
[redacted]	**Gunn Creek**	Gunn Crk flows in a single channel that braids out downstream of the pipeline crossing. Surrounding floodplain vegetation consists of brush and grass. Gunn Crk flows into the Upper Gulkana R just above the Richardson Hwy Bridge. The stream's seasonal flow characteristics were taken below the confluence of Gunn Crk and the Upper Gu kana R.	40 to 50 ft	80 to 120 ft	Summer	Low Flow	40-500	1-3	Booms at Summit Lake
						Rain Floods	500-1,800	2-3	Diversion Booms with Pits, Underflow Dams
					Freezeup	Without Ice Cover	10-88	1-2	Booms at Summit Lake
						With Ice Cover	5-20	0-1	Diversion Booms with Pits, Underflow Dams
					Winter	Under Ice Flow Aufeis Potential: High	0-5	0-1	Underflow Dams, Trenches and Pits
					Breakup	Before Ice Movement	20-200	1-2	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	200-1,500	2-3	Booms at Summit Lake
	Upper Gulkana River (above Gunn Creek confluence)	The Upper Gu kana R flows in an incised channel within a floodplain that is covered by brush and grass. This low gradient stream passes through many beaver dams, above and below the crossing, that regulate flows and velocities throughout the ice-free months. These downstream beaver ponds will serve as excellent containment areas. The Upper Gulkana converges with Gunn Crk approximately 2,000 ft downstream of its pipeline crossing. During freezeup, flow will decrease rapidly and should nearly cease by winter.	3 to 10 ft	10 to 20 ft	Summer	Low Flow	4-30	1-2	Underflow Dams
						Rain Floods	30-70	2-3	Diversion Berms, Booms
					Freezeup	Without Ice Cover	3-20	1-2	Underflow Dams
						With Ice Cover	1-5	0-1	Booms
					Winter	Under Ice Flow Aufeis Potential: High	0-1	0-1	Underflow Dams, Blocking Dams
					Breakup	Before Ice Movement	4-30	1-2	Underflow Dams
						After Ice Movement	30-100	2-3	Diversion Berms, Booms
	No Name Creek	This stream flows in a meandering pattern that is incised within a dense, brush and grass floodplain. The creek flows beneath the Richardson Hwy and into the southeastern corner of Summit Lake, a linear distance of approximately 1,800 ft from the pipeline crossing. The stream is slow moving at the pipeline crossing and contains flow during all seasons. During winter, the creek at several locations has a very thin ice cover which is primarily a result of heavy snow falls prior to extreme cold temperatures.	3 to 7 ft	7 to 12 ft	Summer	Low Flow	3-10	1-2	Underflow Dams, Booms
						Rain Floods	10-30	1-3	Same
					Freezeup	Without Ice Cover	2-4	0-1	Underflow Dams, Booms
						With Ice Cover	2-4	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	1-3	0-1	Underflow Dams, Blocking Dams
					Breakup	Before Ice Movement	3-10	1-2	Underflow Dams, Booms
						After Ice Movement	10-30	1-3	Same
	Fish Creek	Fish Crk flows in a single, incised channel within a floodplain covered with grass and brush. The creek flows beneath the Richardson Hwy and then into the Gulkana R at about 1,000 ft downstream from the pipeline crossing. During open water season, total containment of oil within Fish Crk before it reaches the Gulkana R will be difficult. However, because the Gulkana is a fast-flowing, turbulent stream, even partial containment within Fish Crk would be advantageous.	10 to 15 ft	15 to 35 ft	Summer	Low Flow	20-160	1-2	Underflow Dams, Diversion Booms
						Rain Floods	160-500	2-3	Same
					Freezeup	Without Ice Cover	10-50	0-1	Underflow Dams, Diversion Booms
						With Ice Cover	5-25	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	2-15	0-1	Underflow Dams, Diversion Booms
					Breakup	Before Ice Movement	20-100	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	100-500	2-3	Same
	[redacted]	This stream is characterized by an incised, single channel than meanders through a dense, brush floodplain. About one mile downstream from the pipeline crossing, this stream passes through a culvert beneath the Richardson Hwy and into the Gulkana R. This stream has a steep gradient and flows mostly in riffles; therefore, natural storage areas for containing oil would be difficult to find except at the Richardson Hwy culvert. During freezeup, flow decreases rapidly and ceases by winter.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	2-20	1-2	Underflow Dams, Blocking Dams
						Rain Floods	20-120	1-3	Diversion Berms
					Freezeup	Without Ice Cover	0-10	0-1	Blocking Dams, Underflow Dams
						With Ice Cover	0-5	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams
					Breakup	Before Ice Movement	2-20	1-2	Underflow Dams
						After Ice Movement	20-120	1-3	Diversion Berms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**One Mile Creek**	This creek flows in an incised channel within a dense, brush-covered floodplain. The gradient at this stream is steep and flows mostly in riffles until it has passed through the Richardson Hwy Bridge. Once it enters the Gulkana R floodplain, the gradient decreases and some pools are present that could be used for containment of oil. During the summer, this stream will respond quite rapidly to rainstorm events, producing high velocities. Flow will decrease rapidly during freezeup and cease by winter. During breakup, snow-melt runoff will produce peak discharges for 3 to 10 days.	5 to 10 ft	10 to 20 ft	Summer	Low Flow	10-50	1-3	Underflow Dams, Booms
						Rain Floods	50-300	2-7	Same
					Freezeup	Without Ice Cover	2-15	1-2	Underflow Dams
						With Ice Cover	0-10	0-2	Blocking Dams
					Winter	Under Ice Flow Aufeis Potential: High	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	10-50	1-3	Underflow Dams, Booms
						After Ice Movement	50-300	2-7	Same
	Meiers Creek	Meiers Crk flows in an incised channel within a floodplain that is covered by dense brush.	2 to 10 ft	5 to 15 ft	Summer	Low Flow	5-20	1-2	Underflow Dams, Booms
						Rain Floods	50-100	1-3	Same
					Freezeup	Without Ice Cover	5-10	1-2	Underflow Dams, Booms
						With Ice Cover	2-5	1-2	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Underflow Dams, Blocking Dams
					Breakup	Before Ice Movement	5-20	1-2	Underflow Dams, Booms
						After Ice Movement	50-100	1-3	Same
	Gillespie Creek	Gillespie Crk flows in an incised channel within a floodplain that is covered by dense brush. At the pipeline crossing, this steep gradient stream flows mostly in riffles; however, downstream about 500 ft (at CS10-10), the stream enters a series of pools that would be a suitable containment site. This stream has a lake in its headwaters which will store water during periods of high runoff, and dampen flood peaks downstream. Some flow will probably continue into the winter.	5 to 12 ft	12 to 20 ft	Summer	Low Flow	5-60	1-3	Underflow Dams, Booms
						Rain Floods	60-150	2-5	Same
					Freezeup	Without Ice Cover	5-20	1-2	Underflow Dams, Booms
						With Ice Cover	2-10	0-1	Trenching, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Underflow Dams, Blocking Dams
					Breakup	Before Ice Movement	5-40	1-2	Underflow Dams, Booms
						After Ice Movement	40-150	2-5	Same
	Spring Creek	The pipeline crosses a small tributary to Spring Crk at (b) (7)(F). This tr butary then joins Gillespie Crk and the main branch of Spring Crk. Spring Crk roughly parallels the pipeline, receiving drainage that crosses the workpad. This stream flows in a meandering pattern within a dense brush and tree floodplain. Velocities will be slower in the pools that exist on the outside of each meander. Several lakes exist in the broad valley that could be used for temporary storage of contained oil.	15 to 30 ft	30 to 45 ft	Summer	Low Flow	40-400	1-2	Diversion Booms, Underflow Dams
						Rain Floods	400-1,500	2-3	Same
					Freezeup	Without Ice Cover	20-50	1-2	Underflow Dams, Diversion Booms
						With Ice Cover	5-25	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0	0	Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	40-300	1-2	Diversion Booms, Underflow Dams
						After Ice Movement	300-1,500	2-3	Booms, Same
	Haggard Creek	Haggard Crk flows in a meandering pattern that is incised within a dense brush floodplain. Pools, with slower velocities, exist at the outside of each meander. During freezeup, flow will decrease rapidly and should cease by winter.	5 to 10 ft	10 to 25 ft	Summer	Low Flow	20-100	1-2	Underflow Dams, Diversion Booms
						Rain Floods	100-400	1-3	Same
					Freezeup	Without Ice Cover	10-40	0-1	Underflow Dams, Sorbents
						With Ice Cover	5-10	0-1	Trenches, Same
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Blocking Dams, Snow Berms
					Breakup	Before Ice Movement	20-100	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	100-400	1-3	Same

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Gulkana River**	The Gulkana R flows in a meandering pattern that is confined to a single channel. During periods of low summer flow, there are exposed gravel bars along the banks. This gravel could be used to dike off part of the channel's width, creating a pool into which oil could be diverted. During rainstorm floods, the water level will rise up to the vegetation line, making containment of oil more difficult. Diversion booming should be located where the contained oil could be diverted or pumped into one of the few ponds located in the floodplain. During freezeup, the flow decreases gradually and will begin to stabilize once the river is completely ice covered. Flow will continue throughout the winter. In some areas, water will overflow onto the ice cover and build aufeis. Where aufeis exists, flow can be expected beneath the ice. Oil should be kept from entering the flow beneath the ice. Snow-melt runoff will raise the river's water level rather quickly and begin breakup along the river suddenly. Ice floes commonly jam, causing backwater and overbank flooding. Containment of oil during this period will be extremely difficult.	150 to 250 ft	250 to 400 ft	Summer	Low Flow	600-3,000	1-2	Diversion Booms, Diversion Berms
						Rain Floods	3,000-12,000	2-4	
					Freezeup	Without Ice Cover	400-1,000	1-2	Diversion Booms, Diversion Berms
						With Ice Cover	200-400	0-1	
					Winter	Under Ice Flow Aufeis Potential: High	100-300	0-1	Diversion Berms, Snow Berms on Top of Ice
					Breakup	Before Ice Movement	100-3,000	1-2	Diversion Booms, Diversion Berms
						After Ice Movement	3,000-12,000	2-4	Diversion Booms Diversion Berms
	Tazlina River	The Tazlina R flows in a meandering pattern that is entrenched within a broad valley. It joins the Copper R about 6 miles downstream from the pipeline crossing. During the summer, the discharge is largely dependent on glacial melt. Peak flows may occur during warm, sunny periods as well as following rainstorms. During freezeup, the discharge will decrease gradually and finally stabilize during early winter. Considerable flow beneath the ice will persist throughout the winter. Efforts should be directed towards eliminating the oil from entering the water beneath the ice. Following breakup, river discharge will normally continue to increase due to upland snow melt and glacial melt. Because the river has a relatively steep gradient that produces high velocities, containment will be difficult during periods of high flow.	250 to 400 ft	400 to 600 ft	Summer	Low Flow	2,000-10,000	1-3	Diversion Booms with Pits
						Rain Floods	10,000-26,000	2-6	
					Freezeup	Without Ice Cover	500-1,500	1-2	Diversion Booms with Pits
						With Ice Cover	200-1,000	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	200-500	1-2	Snow Berms, Diversion Booms
					Breakup	Before Ice Movement	500-1,500	1-2	Diversion Booms with Pits
						After Ice Movement	1,500-5,000		
	Klutina River	At the pipeline crossing, the Klutina R flows in an irregular, sinuous pattern with an incised, single channel. High water channels upstream and downstream of the Richardson Hwy bridge could be used to contain oil in conjunction with diversion booming. The Klutina R joins the Copper R one and one-half miles downstream of the crossing. During the summer, flow fluctuations in the river resulting from rainfall, snow melt, and glacial melt are gradual due to the upstream storage in Klutina Lake. During freezeup, ice initially forms along the edges of the river and some ice floes float downstream; the river becomes ice-covered by mid-December. Flow beneath the ice continues throughout the winter. During the breakup period, ice flows in the channel 5 to 10 days before the river flushes itself ice-free. The discharge will probably continue to increase resulting from mountain runoff. The Klutina R has a steep gradient resulting in relatively fast velocities. Containment of oil prior to the Copper R confluence will be difficult.	100 to 250 ft	250 to 400 ft	Summer	Low Flow	2,000-4,000	2-4	Diversion Booms, Sorbents
						Rain Floods	4,000-7,000	3-6	
					Freezeup	Without Ice Cover	1,000-2,000	1-3	Diversion Booms, Sorbents
						With Ice Cover	500-1,000	1-2	Snow Berms, Ice Slots
					Winter	Under Ice Flow Aufeis Potential: Low	100-500	1-2	Sorbents, Ice Slots
					Breakup	Before Ice Movement	500-1,500	1-3	Ice Slots, Snow Berms, Sorbents
						After Ice Movement	1,500-4,500	2-4	Diversion Booms
	Copper River	The Copper R originates near Mt. Kimbal in the Alaska Range, and flows generally south for approximately 230 miles before it empties into the Gulf of Alaska, near Cordova. It has many tributaries, the largest being the Gulkana and Chitina R. The pipeline does not cross the river, but runs parallel to it within 5 miles for approximately 30 miles, between Gulkana and Willow Crk, The pipeline does cross several of the Copper R's tributaries, including the Tazlina, Klutina, Tonsina, and Tiekel rivers. From the inflow of the Tazlina R, the Copper R flows 150 miles, mainly south, to its terminus at the Gulf of Alaska.	550 to 650 ft	650 to 720 ft	Summer	Low Flow	50,000-75,000	4-5	Diversion Booms, Sorbents
						Rain Floods	75,000- 170,000	5-6	Diversion Berms, Sorbents
					Freezeup	Without Ice Cover	30,000-80,000	4-5	Diversion Booms, Sorbents
						With Ice Cover	9,000-12,000	3-4	Ice Slots
					Winter	Under Ice Flow Aufeis Potential: High	8,000-20,000	3-4	Ice Slots, Snow Berms on Top of Ice
					Breakup	Before Ice Movement	8,000-10,000	4-5	Snow Berms, Sorbents
						After Ice Movement	50,000-70,000	5-6	Diversion Berms, Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Willow Creek**	At, and immediately downstream from, the pipeline crossing, Willow Crk flows through a marshy area within which the actual stream channel is poorly defined. Water is ponded in the marshy area during spring and most of the summer. Downstream from the marsh are a series of beaver dams and ponds. The flooded marsh and ponds would make good locations for containing oil.	5 to 20 ft	15 to 40 ft	Summer	Low Flow	5-50	0-1	Booms, Underflow Dams
						Rain Floods	50-200	1-2	Sorbents
					Freezeup	Without Ice Cover	5-20	0-1	Booms, Underflow Dams
						With Ice Cover	2-10	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Blocking Dams, Sorbents
					Breakup	Before Ice Movement	5-50	0-1	Booms
						After Ice Movement			
	Rock Creek	Rock Crk flows in a single, incised channel. The banks and floodplains are well-vegetated with trees and brush, which offer debris to the stream during flood flows. Debris jams will often cause backwater and overbank flooding. This steep gradient stream will have fast velocities during periods of high flow. The winter flow will be minimal.	5 to 10 ft	10 to 30 ft	Summer	Low Flow	10-80	1-3	Underflow Dams, Overflow Berms
						Rain Floods	80-250	2-5	Sorbents
					Freezeup	Without Ice Cover	5-25	1-2	Underflow Dams, Overflow Berms
						With Ice Cover	2-15	1-2	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Snow Berms
					Breakup	Before Ice Movement	10-50	1-2	Underflow Dams, Overflow Berms
						After Ice Movement	50-250	2-5	Sorbents
	Squirrel Creek	Squirrel Crk flows in a single, incised channel. The well-vegetated floodplain is bounded by steep, valley walls. This relatively steep gradient stream maintains fast velocities during periods of high flow. Squirrel Crk passes beneath the Richardson Hwy about 2 miles downstream from the pipeline crossing.	10 to 20 ft	20 to 40 ft	Summer	Low Flow	30-80	2-3	Underflow Dams, Diversion Booms with Pits
						Rain Floods	80-800	2-5	Sorbents
					Freezeup	Without Ice Cover	20-50	2-4	Underflow Dams, Diversion Booms with Pits
						With Ice Cover	10-20	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	5-15	1-2	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	10-50	1-3	Underflow Dams, Diversion Booms with Pits
						After Ice Movement	50-500	2-5	Sorbents
	Tonsina River	Downstream of the pipeline crossing, the Tonsina R flows in a split-channel pattern. There are several high-water channels that flow only during periods of high flow. During normal and low flow periods, these channels could be used advantageously as temporary storage sites for contained oil. During high flow, by constructing berms at the inlet and outlet of the high-water channels, they could be converted into temporary storage ponds to receive diverted oil. The Tonsina R upland watershed consists mostly of glacial, mountainous terrain and the river flows through Tonsina Lake. The flow characteristics for the Tonsina are somewhat different from other rivers. During breakup, the lowland snow melt will increase the discharge and flush the river free of ice. Following breakup, the discharge will continue to increase as the snow melt extends to the higher elevations. During the summer, flow will be dependent on glacial melt as well as rainstorms. Tonsina Lake will dampen flood peaks, but lengthen the duration of floods. The flow will increase gradually during freezeup, and some flow will continue beneath the ice cover throughout the winter.	80 to 150 ft	150 to 300 ft	Summer	Low Flow	800-2,000	2-4	Diversion Booms with Pits
						Rain Floods	2,000-7,000	2-6	
					Freezeup	Without Ice Cover	500-1,000	1-2	Diversion Booms with Pits
						With Ice Cover	100-500	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	40-150	1-2	Underflow Dams
					Breakup	Before Ice Movement	200-800	1-3	Diversion Booms with Pits
						After Ice Movement	800-2,500	2-4	
	Fourth of July Creek	This stream joins the Little Tonsina R about 1,000 ft downstream from the pipeline crossing. It flows in a single channel that meanders within a well-vegetated floodplain.	5 to 20 ft	15 to 40 ft	Summer	Low Flow	5-40	1-2	Underflow Dams, Booms
						Rain Floods	40-200	1-3	Sorbents
					Freezeup	Without Ice Cover	5-13	0-1	Underflow Dams, Booming
						With Ice Cover	2-10	0-1	Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Blocking Dams, Snow Berms, Sorbents
					Breakup	Before Ice Movement	10-40	0-2	Underflow Dams, Booms
						After Ice Movement	40-200	1-3	Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Little Tonsina River**	The pipeline parallels the Little Tonsina through most of its watershed. The Little Tonsina R crosses the pipeline in its upland reaches where the stream is smaller. The following discussion generally refers to the lower half of the Little Tonsina R. The Little Tonsina R flows in a meandering pattern within a well-vegetated floodplain. The gradient of this stream is gentle; hence, the velocities are low. With the channel moderately incised and low velocities prevailing during normal flow conditions, booming operations should be quite adequate. Flow will decrease gradually during freezeup, but some flow beneath the ice cover will continue throughout the winter. Breakup will be relatively gentle with ice flowing in the stream for 5 to 10 days.	30 to 50 ft	50 to 70 ft	Summer	Low Flow	30-150	0-1	Booms, Underflow Dams
						Rain Floods	150-1,000	1-2	Sorbents
					Freezeup	Without Ice Cover	10-40	0-1	Underflow Dams, Sorbents
						With Ice Cover	5-15	0.5-1	
					Winter	Under Ice Flow Aufeis Potential: Low	2-10	0.5-1	Underflow Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	10-80	0-1	Booms, Underflow Dams
						After Ice Movement	80-800	1-2	Sorbents
	Fifty-Nine Mile Creek	Fifty-Nine Mile Crk is a steep, sloped, mountainous stream that flows in a pool and waterfall pattern. The bed has several large boulders which increase the turbulence of the water and, hence, potential emulsification of the oil. During freezeup, the flow will decrease rapidly prior to major ice formation. Sections of the creek might remain open during some winters. During breakup, little floating ice will be present. Rainstorms during June and July, coupled with snowmelt, will produce maximum flow. The bridge a[(b) (7)(F),] provides a good location to construct an underflow dam. **Note:** The Department of Transportation calls it Wagon Point Crk. This is how the creek is referred to locally.	5 to 15 ft	15 to 25 ft	Summer	Low Flow	5-40	1-4	Underflow Dams, Diversion Booms
						Rain Floods	40-300	2-5	Sorbents
					Freezeup	Without Ice Cover	2-20	0-2	Underflow Dams, Sorbents
						With Ice Cover	1-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	5-40	0-2	Underflow Dams, Diversion Booms
						After Ice Movement	40-200	2-5	Sorbents
	Squaw Creek	Squaw Crk is a steep, sloped, mountainous stream that flows in a pool and waterfall pattern. The bed has several large boulders which increase the turbulence of the water and, hence, potential emulsifications of the oil. During freezeup, the flow will decrease rapidly prior to major ice formation. Sections of the creek might remain open during some winters. During breakup, little floating ice will be present. Rainstorms during June and July, coupled with snowmelt, will produce maximum flow. The bridge at[(b) (7)] provides a good location to construct an underflow dam. Containment of as much oil as possible should be accomplished before it enters the Tiekel R, 600 ft downstream.	5 to 15 ft	15 to 25 ft	Summer	Low Flow	5-30	0-2	Underflow Dams, Diversion Booms
						Rain Floods	30-300	2-5	Sorbents
					Freezeup	Without Ice Cover	2-15	1-2	Underflow Dams, Sorbents
						With Ice Cover	1-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	5-30	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	30-150	2-5	Sorbents
	Boulder Creek	Boulder Crk is a steep, sloped, mountainous stream that flows in a pool and waterfall pattern. The bed has several large boulders which increase the turbulence of the water and, hence, potential emulsification of the oil. During freezeup, the flow will decrease rapidly prior to major ice formation. Sections of the creek might remain open during some winters. During breakup, little floating ice will be present. Rainstorms during June and July, coupled with snowmelt, will produce maximum flow. The bridge a[(b) (7)(F),] provides a good location to construct an underflow dam. Containment of as much oil as possible should be accomplished before it enters the Tiekel R, 1,500 ft downstream from the pipeline crossing.	5 to 15 ft	15 to 25 ft	Summer	Low Flow	5-50	1-4	Underflow Dams, Diversion Booms
						Rain Floods	50-400	2-5	Sorbents
					Freezeup	Without Ice Cover	5-25	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-5	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	0-2	0-1	Underflow Dams, Sorbents, Blocking Dams
					Breakup	Before Ice Movement	5-50	1-2	Underflow Dams, Diversion Booms
						After Ice Movement	50-300	3-7	Sorbents
	Tiekel River	The pipeline parallels the Tiekel R for about 20 miles and crosses the river twice. The Tiekel R flows in a single channel within a meandering pattern. Several high-water channels exist that could be used as temporary containment sites during low flow periods. Exposed gravel bars provide material for constructing berms to assist diversion booming and containment procedures. During periods of high flow, the high-water channels could be converted into temporary containment sites by berming off the entrance and exit to the channel. The proper location of diversion booms could then possibly divert the oil into the channels. High velocities will require reconnaissance to select locations where diversion booming would be applicable. Flow continues throughout the winter with some localized areas remaining ice free. During breakup, snow melt will cause distinct high discharges. The flow will then decrease until summer glacial melt, and rainstorms will again cause peak discharges.	50 to 120 ft	120 to 250 ft	Summer	Low Flow	100-1,000	1-3	Diversion Booms
						Rain Floods	1,000-3,400	2-5	
					Freezeup	Without Ice Cover	100-400	1-2	Diversion Booms, Underflow Dams
						With Ice Cover	50-100	0-1	
					Winter	Under Ice Flow Aufeis Potential: Low	25-75	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	100-1,000		
						After Ice Movement	1,000-2,600	2-4	Diversion Booms

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Stuart Creek**	At the pipeline crossing, Stuart Crk flows in a single, straight channel. It then braids out for a short reach prior to being constricted into a single channel at the Richardson Hwy bridge. The creek is steep, flows at high velocities, and is quite turbulent due to boulders. The two best locations for containment are at the braided reach, 1,000 ft downstream from the pipeline and in the fan just before Stuart Crk enters the Tsina R. Because of the high velocities, containment during open water seasons would be best accomplished by diversion booms, coupled with excavated containment pits. The velocities could be slowed, using berms constructed from floodplain gravels. This glacial-fed creek will probably have peak discharge during mid-summer. Flow will decrease during freezeup, but will continue beneath the ice and snow during the winter. Aufeis normally forms at the confluence with the Tsina R. Breakup will be gradual and little or no ice will be flowing in the channel. Although it will be difficult to contain all the oil before it reaches the Tsina R, as much as possible should be accomplished.	30 to 60 ft	60 to 100 ft	Summer	Low Flow	50-800	2-5	Diversion Booms with Pits
						Rain Floods	800-2,400	3-7	Underflow Dams
					Freezeup	Without Ice Cover	20-200	1-3	Diversion Booms with Pits
						With Ice Cover	10-50	1-2	Sorbents
					Winter	Under Ice Flow Aufeis Potential: High	2-10	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	40-500	1-4	Diversion Booms with Pits
						After Ice Movement	500-1,500	2-6	Underflow Dams
	Tsina River	The Tsina R is crossed by the pipeline three times and parallels it for 15 miles. This river has a steep gradient which produces high velocities. Where the Tsina R flows in an incised, single channel, the velocities will be high and containment will be extremely difficult. However, in the braided reaches at (b) (7)(F), (b) (3), the use of diversion booms and constructed containment pits in the gravel floodplain could be employed to contain oil successfully. The Tsina R is glacially fed and maximum discharges will occur during mid-summer. During freezeup, the flow will decrease rapidly, but flow will continue beneath the ice and snow cover throughout the winter. Aufeis will commonly form near the confluence with Stuart Crk. During breakup, the flow will increase steadily with minor ice flowing in the channels.	60 to 120 ft	120 to 300 ft	Summer	Low Flow	400-2,000	2-6	Diversion Booms with Pits
						Rain Floods	2,000-7,000	3-7	
					Freezeup	Without Ice Cover	200-500	1-3	Diversion Booms with Pits
						With Ice Cover	20-200	1-2	Underflow Dams
					Winter	Under Ice Flow Aufeis Potential: High	5-20	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	100-600	1-4	Diversion Booms with Pits
						After Ice Movement	600-3,000	2-6	
	Bear Creek	The creek (b) (7)(F), is a steep, sloped, glacial-fed stream that flows in a pool and waterfall pattern. The stream has several boulders which increase the turbulence and, hence, the possibility of oil emulsification. Bear Crk flows into the Tsina R, 1,500 ft downstream from the pipeline crossing. Due to the steep gradient and close proximity to the Tsina R, containment of oil prior to it entering the Tsina will be extremely difficult during open water periods. However, containment of as much as possible is advised. During freezeup, the flow will decrease rapidly prior to major ice formation. Sections of the creek might remain ice free during some winters. During breakup, little floating ice will be present. Rainstorms during June and July, coupled with snow and glacial melt, will produce maximum flows.	15 to 30 ft	30 to 45 ft	Summer	Low Flow	10-50	1-3	Diversion Booms with Pits
						Rain Floods	50-150	2-5	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	5-40	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-15	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	2-5	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	10-50	1-3	Diversion Booms with Pits
						After Ice Movement	50-100	2-4	Underflow Dams
	North Worthington Creek	North Worthington Crk is a moderately sloped, glacial-fed stream. During freezeup, the flow will decrease rapidly prior to major ice formation. Sections of the creek might remain ice free beneath the heavy snow cover throughout the winter. During breakup, the flow will increase steadily, but little floating ice will be present. Rainstorms during the summer, coupled with snow and glacial melt, will produce maximum flows. The wide, gravel fan at the confluence with Ptarmigan Crk is a good location to employ diversion booming and to construct containment pits.	30 to 50 ft	50 to 80 ft	Summer	Low Flow	10-100	1-3	Diversion Booms with Pits
						Rain Floods	100-300	2-5	Underflow Dams
					Freezeup	Without Ice Cover	10-40	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-15	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	1-5	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	10-60	1-3	Diversion Booms with Pits
						After Ice Movement	60-200	2-5	Underflow Dams
	South Worthington Creek	This stream is a moderately sloped, glacial-fed stream. During freezeup, the flow will decrease rapidly prior to major ice formation. Sections of the creek might remain ice free beneath a heavy snow cover throughout the winter. During breakup, the flow will increase steadily, but little floating ice will be present. Rainstorms during the summer, coupled with snow and glacial melt, will produce maximum flows. The highway culvert would be a good location to construct an underflow dam.	20 to 40 ft	40 to 60 ft	Summer	Low Flow	10-60	1-3	Diversion Booms with Pits
						Rain Floods	60-200	2-7	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	5-30	1-2	Underflow Dams, Sorbents
						With Ice Cover	2-10	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	1-5	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	10-50	1-3	Diversion Booms with Pits
						After Ice Movement	50-150	2-5	Underflow Dams, Sorbents

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)	**Ptarmigan Creek**	Ptarmigan Crk crosses terrain ranging from steep to flat and flows in a wide, alluvial floodplain just downstream from the pipeline crossing. The creek flows through a culvert at the Richardson Hwy. Some glacial tributaries feed this system; however, the primary origin is snowmelt with Ptarmigan Lake acting as a storage basin. The presence of boulders in this creek causes turbulence and increases the poss bility of oil emulsification. Flow will decrease rapidly during freezeup; however, some flow either on the surface or intragravel will probably continue throughout the winter. Breakup will be gradual with little or no ice flowing in the channel. Rainstorms during the summer, coupled with snow and glacial melt, will produce maximum flow. The wide, gravel floodplain near the Richardson Hwy is a good location to implement diversion booms and containment pits. Channel modifications may be required to slow velocities.	20 to 60 ft	60 to 120 ft	Summer	Low Flow	40-200	1-3	Diversion Booms with Pits
						Rain Floods	200-800	2-4	Underflow Dams
					Freezeup	Without Ice Cover	20-80	1-2	Underflow Dams, Sorbents
						With Ice Cover	10-40	1-2	
					Winter	Under Ice Flow Aufeis Potential: Low	2-10	0-1	Underflow Dams, Sorbents, Snow Berms
					Breakup	Before Ice Movement	20-150	1-2	Diversion Booms with Pits
						After Ice Movement	150-600	2-4	Underflow Dams
	Sheep Creek	Sheep Crk is a steep, sloped, glacial-fed stream. Velocities are high, and the presence of boulders in the channel cause turbulence which will increase the possibility of oil emulsification. Sheep Crk fans out into the Lowe R, 1,500 ft downstream from the pipeline crossing. Glacial melt will largely govern the flow in this creek, and diurnal fluctuations can be expected during warm, summer periods. During freezeup and winter, some flow will persist. Flow will increase steadily during breakup and little or no floating ice will be in the channel. During open water periods, the high velocities will make containment procedures extremely difficult. Containment procedures should take advantage of the gravel floodplain materials.	40 to 70 ft	70 to 150 ft	Summer	Low Flow	100-800	2-6	Diversion Booms with Pits
						Rain Floods	800-2,500	2-7	
					Freezeup	Without Ice Cover	50-200	1-3	Diversion Boom with Pits
						With Ice Cover	10-40	1-2	Underflow Dams, Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	2-10	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	50-300	1-3	Diversion Booms with Pits
						After Ice Movement	300-1,500	2-6	
	Lowe River	Except through Keystone Canyon, the Lowe R flows in a braided pattern with several channels dividing and uniting, separated by gravel bars and islands. The channels will often change their courses rapidly during flood events; thus, the channel locations may be different than the way they appear on aerial photography. However, the general characteristics of the river will remain the same. The Lowe R floodplain offers a plentiful supply of gravel materials that could be used during containment procedures. The floodplain gravels are highly permeable. Therefore, containment pits should be lined to prevent oil from permeating the gravels. The steep gradient of this river develops velocities greater than 3 fps in the major channels and most of the subchannels during the summer. Often velocities will exceed 4 fps, which precludes the ability of effectively operating containment procedures. Modification of the channels (using gravel floodplain material) by diverting subchannel flow and/or slowing velocities by widening and deepening the channel may be required to enable diversion booming of the oil to a containment pit. Containment procedures should trap the oil in the side-channels and keep the oil out of the major channels. During freezeup, flows and velocities will progressively decrease as ice begins to form and flow in the channels. The smaller subchannels will freeze up and cease flow first. Flowing ice in the major channels can jam, backing water and ice upstream. Flow continues throughout the winter and spring seepage can maintain open water pockets. Aufeis forms in occasional pockets in the Lowe R. During breakup, water will initially flow over the ice and melt channels through the bed-fast ice. As flow increases, the ice-bounded channel dimensions will increase, eventually melting the ice away. Some ice chunks will calve off the flow in the channels, but, generally, ice jams do not occur. Flow fluctuations are largely dependent on rainstorm events and glacial melt; large diurnal fluctuations in flow can be expected due to glacial melt.	100 to 300 ft	250 to 500 ft	Summer	Low Flow	1,000-3,000	2-5	Diversion Booms with Pits
						Rain Floods	3,000-10,000	3-7	Underflow Dams in Side Channels
					Freezeup	Without Ice Cover	500-1,500	1-3	Diversion Booms with Pits
						With Ice Cover	100-500	1-2	Underflow Dams in Side Channels
					Winter	Under Ice Flow Aufeis Potential: Low	40-120	0-1	Underflow Dams, Sorbents, Diversion Booms
					Breakup	Before Ice Movement	100-800	1-3	Diversion Booms with Pits
						After Ice Movement			Underflow Dams in Side Channels
	Brown Creek	Brown Crk is a steep, sloped, glacial-fed stream. Velocities are high and the presence of boulders in the channel causes turbulence which will increase the possibility of oil emulsification. Brown Crk fans out into the Lowe R, 1,500 ft downstream from the pipeline crossing. Glacial melt will largely govern the flow in this creek, and diurnal fluctuations can be expected during warm, summer periods. During freezeup, some flow will persist. Flow will increase steadily during breakup, and little or no floating ice will be in the channel. During open water periods, take advantage of the gravel floodplain materials by making channel modifications to slow velocities and diverting oil into excavated containment pits.	50 to 150 ft	100 to 300 ft	Summer	Low Flow	100-1,000	1-5	Diversion Booms with Pits
						Rain Floods	1,000-3,500	3-8	Underflow Dams
					Freezeup	Without Ice Cover	50-200	1-3	Underflow Dams, Diversion Berms
						With Ice Cover			Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	100-800	1-3	Diversion Booms with Pits
						After Ice Movement	800-1,500	2-5	Underflow Dams

HYDROLOGY OF MAJOR DRAINAGES

PLMP	LOCATION	DESCRIPTION	WIDTH AT NORMAL FLOW	WIDTH AT HIGH FLOW	SEASON	CONDITION	DISCHARGE (CFS)	VELOCITY (MPH)	CONTAINMENT METHODS
(b) (7)(F), (b) (3)		Unnamed Crk is a steep, glacial-fed stream with high velocities. Unnamed Crk fans out into the Lowe R, 3,000 ft downstream from the pipeline crossing. Glacial melt will largely govern the flow in this creek, and daily fluctuations can be expected during warm, summer periods. During freezeup, some flow will persist. Flow will increase steadily during breakup, and little or no floating ice will be in the channel. During open water periods, the high velocities will make containment procedures extremely difficult. Containment procedures should take advantage of the gravel floodplain materials by constructing channel modifications to slow velocities and diverting oil into excavated containment pits.	40 to 70 ft	70 to 150 ft	Summer	Low Flow	100-800	2-4	Diversion Booms with Pits
						Rain Floods	800-2,000	3-7	Underflow Dams
					Freezeup	Without Ice Cover	50-200	1-3	Diversion Booms with Pits
						With Ice Cover	10-40	1-3	Underflow Dams, Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	0-5	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	50-300	1-3	Diversion Berms, Underflow Dams
						After Ice Movement	300-1,500	2-6	
792.4	**Sulphide Gulch Creek**	At the pipeline crossing, Sulphide Gulch flows in a steep canyon with several waterfalls. Containment will not be possible until it reaches the Lowe R vegetated terrace.	15 to 25 ft	25 to 40 ft	Summer	Low Flow	10-80	1-3	Diversion Berms, Underflow Dams
						Rain Floods	80-400	2-6	Underflow Dams
					Freezeup	Without Ice Cover	10-50	1-3	Diversion Berms, Underflow Dams
						With Ice Cover	5-30	1-2	Ice Slots & Berms
					Winter	Under Ice Flow Aufeis Potential: Low	2-10	1-2	Ice Slots & Berms, Sorbents
					Breakup	Before Ice Movement	10-80	1-3	Diversion Berms, Underflow Dams
						After Ice Movement	80-300	3-6	Diversion Berms, Underflow Dams
795.9	**Abercrombie Gulch Creek**	At the pipeline crossing, Abercrombie Crk has been diverted to parallel the pipeline for about 2,000 ft before crossing the right-of-way. Downstream of the pipeline, the creek enters a ponded area with low velocities which may be subject to tidal action. During open water periods, the low velocity area between the highway and workpad is a good location for containment booming. Because of the tidal influence, the stream's seasonal flow characteristics are not applicable. The unexpected velocities and potential containment methods are not included in the table at right.	20 to 80 ft	80 to 160 ft	Summer	Low Flow	Not Measured	1-1.5	Underflow Dams, Sorbents
						Rain Floods	Not Measured	1-2	Underflow Dams, Sorbents
					Freezeup	Without Ice Cover	Not Measured	1-1.5	Underflow Dams, Sorbents
						With Ice Cover	Not Measured	0-1	Underflow Dams, Sorbents
					Winter	Under Ice Flow Aufeis Potential: Low	Not Measured	0-1	Underflow Dams, Sorbents
					Breakup	Before Ice Movement	Not Measured	1-1.5	Underflow Dams, Sorbents
						After Ice Movement	Not Measured	1-2	Underflow Dams, Sorbents

TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN



Volume 4
Map Atlas

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TRANS ALASKA PIPELINE SYSTEM

PIPELINE OIL DISCHARGE PREVENTION AND CONTINGENCY PLAN

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CP-35-1

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Revision History

Approved by: **Wes Willson,** *Emergency Preparedness and Compliance Manager*, December 21, 2011

Document Title	Document Number	
Trans Alaska Pipeline System Pipeline Oil Discharge Prevention and Contingency Plan *Map Atlas*	*CP-35-1 Volume 4*	
Current Revision Features	**Ed. 2, Rev. 0**	**December 21, 2011**
Approval to publish Government Letter 24796. Initial issue of Volume 4, Edition 2, Revision 0.		
Revision Features	**Ed. 1, Rev. 1**	**April 14, 2011**
Approval to publish Government Letter 23037. Containment site information has been updated in various aerial and C-Plan maps (GL 22498).		
Revision Features	**Ed. 1, Rev. 0**	**January 30, 2007**
Approval to publish Government Letter 10683. Initial issue of this manual. This manual replaces *CP-35-1 GP, CP-35-1 Region 1, CP-35-1 Region 2, CP-35-1 Region 3, CP-35-1 Region 4,* and *CP-35-1 Region 5*.		

Please note that 345 pages of maps and diagrams have been redacted in accordance with FOIA exemptions (b) (7)(F) and (b)(3).