[redacted]

WICKLAND
PIPELINES LLC

SACRAMENTO INTERNATIONAL AIRPORT
SMF PIPELINE
&
SAN JOSE INTERNATIONAL AIRPORT
SJC PIPELINE

OIL SPILL CONTINGENCY PLAN

SEQUENCE NUMBER 1704

Wickland Pipelines LLC
8950 Cal Center Drive Suite 125
Sacramento, CA 95826

Operator Identification Number 31136

Prepared by:
Wickland Pipelines LLC
&
RC Enterprises, Inc.
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Walnut Creek, CA 94596

WICKLAND PIPELINES LLC
OSCP DISTRIBUTION

1. U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration
2. State of California Office of State Fire Marshal, Pipeline Safety Division
3. Wickland Pipelines LLC Corporate Office
4. Wickland Pipelines LLC SMF Pipeline Field Office
5. Wickland Pipelines LLC SJC Pipeline Field Office

REVIEW AND REVISION LOG

February, 2014 – Wickland Pipelines LLC OSCP was updated based on items identified as deficient by PHMSA in a letter dated January 9, 2014. Sections 1, 2, 6, 8, and 9 were updated.

November, 2010 – Wickland Pipelines LLC OSCP was updated to include Wickland's new pipeline segment in San Jose, CA, the SJC Pipeline. (The previous OSCP covered Wickland's only other pipeline segment, the SMF Pipeline in Sacramento, CA.) All sections were updated to incorporate the SJC Pipeline. Wickland's Primary Response Organization information was updated. Appendix A was divided into two portions: Appendix A-1 which covers the SMF Pipeline and Appendix A-2 to cover the SJC Pipeline.

July, 2010 – Wickland Pipelines LLC OSCP was updated for its 5-year review to include updated phone and contact information. Portions of Sections 1 through 7 were updated.

July, 2005 – Wickland Pipelines LLC OSCP developed prior to initial operation of SMF Pipeline.

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1.1 Plan Purpose And Scope

1.1.1 Purpose

The Wickland Pipelines Oil Spill Contingency Plan (OSCP) Sequence Number 1704 is designed to assist Wickland Pipelines LLC (Wickland) as the pipeline owner and operator (Operator), whose Operator Identification Number is 31136, in protection of public safety and the environment through an active program of oil spill preventions, emergency response planning, and emergency response training. This is accomplished through cooperative interaction with specialized support contractors and local government agencies, both prior to, and during emergency situations.

1.1.2 Scope

The Wickland OSCP addresses prevention of and response to releases of petroleum products related to the operation of Wickland's fuel pipelines. Wickland's pipeline system is comprised of two independent segments, one which supplies jet fuel to Sacramento International Airport (SIA) from Kinder Morgan Energy Partners (KMEP) common carrier pipeline in West Sacramento (SMF Pipeline) and the other which supplies jet fuel to the San Jose International Airport (SJIA) from KMEP's terminal in San Jose (SJC Pipeline). Wickland manages the following facilities and operations:

SMF Pipeline

- A meter station in West Sacramento that provides for the connection and isolation between the KMEP and Wickland Pipelines, metering for custody transfer, meter proving, and pig launching;
- An interconnecting pipeline; and
- A receiving station at SIA that provides for the connection and isolation between the Wickland pipeline and the SIA tank farm, a backpressure valve, flow metering for leak detection, and pig receiving.

SJC Pipeline

- A pump station at KMEP San Jose terminal that provides for the connection and isolation between the KMEP tank farm and Wickland Pipelines, product pumping, metering for custody transfer, meter proving, and pig lauching;
- An interconnecting pipeline; and
- A receiving and filter station at SJIA that provides for the connection and isolation between the Wickland pipeline and the SJIA tank farm, filtering, flow metering for leak detection, and pig receiving.

The location of the SMF Pipeline and the SJC Pipeline are shown in Figure 1.1 and Figure 1.2, respectively. Detailed descriptions of the pipeline systems are included in Appendix A-1 (SMF Pipeline) and Appendix A-2 (SJC Pipeline).

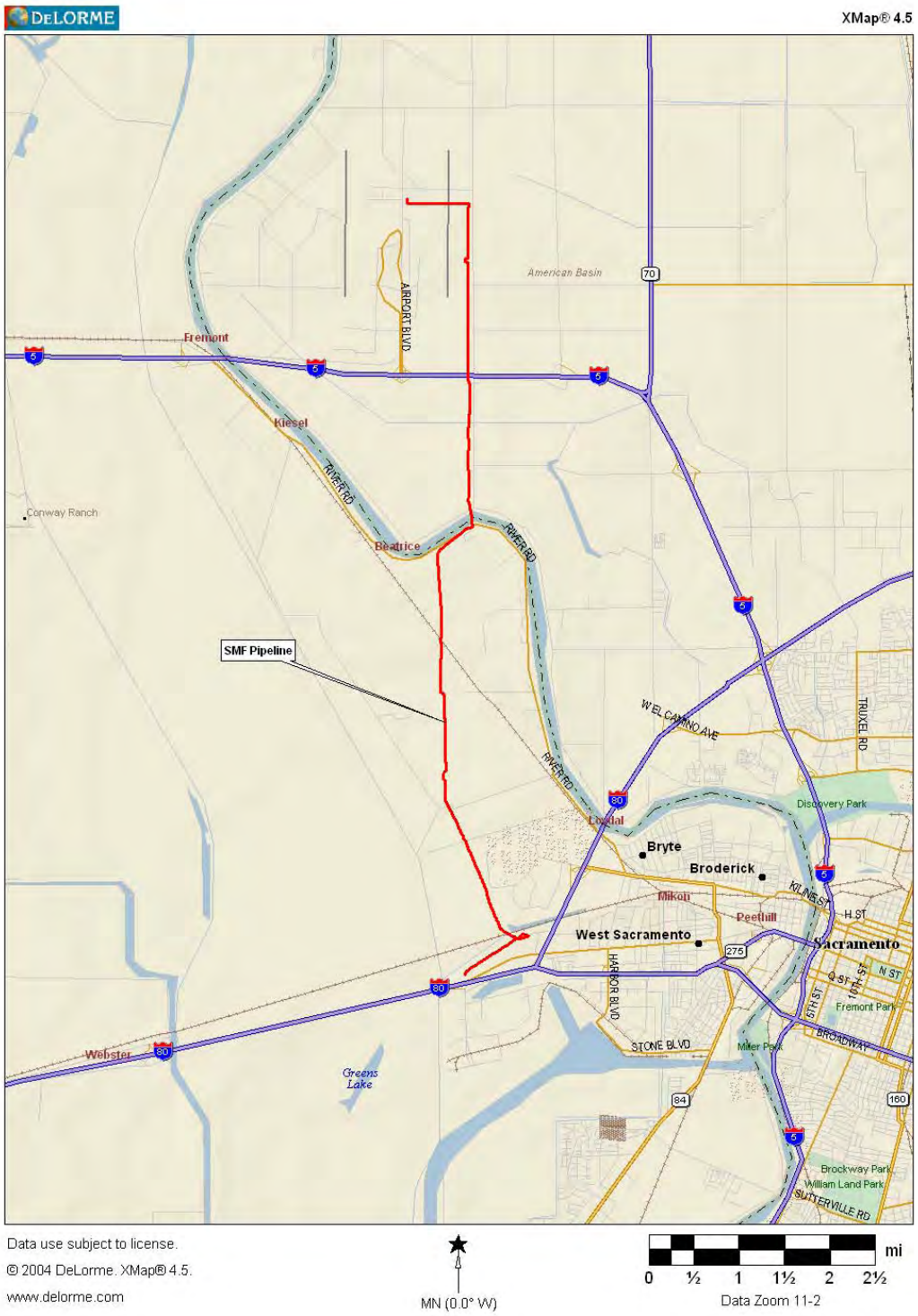

Figure 1.1 Location of the SMF Pipeline

(b) (7)(F)

[redacted]

The Wickland OSCP has been designed to address the following Oil Pollution Action (OPA '90) requirements:

- Department of Transportation, Pipeline and Hazardous Materials Safety Administration (PHMSA) 49 CFR Part 194 Response Plans for Onshore Pipelines (Oct. 1, 2003);
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.119, Emergency Action Plan Regulation (July 1, 2004); and
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 19190120, HAZWOPER Regulation (July 1, 2004).

The requirements of these agencies are addressed through a single integrated Facility Response Plan. Cross references to specific Part 194 requirements are included in Table 1.1.

Part 194 PHMSA Response Planning Requirements	OSCP Location
194.103 Significant and Substantial Harm Statement	1.4
194.105 Worst Case Discharge	1.2.6
194.107 General Response Plan Requirements	-
(a) Response Planning Requirements	1.6
(b) Language Requirements	English
(c) Consistency with NCP and ACP	1.6
(d) Each Response Plan Must Include:	-
(1) Core Plan Contents	i
(i) Information Summary (194.113)	1.2
(ii) Immediate Notification Procedures	2.0
(iii) Spill Detection and Mitigation Procedures	A.2
(iv) OSRO Name, Address, Telephone	1.7, 7.5, 7.6
(v) Response Activities and Response Resources	5.0
(vi) Names and Telephone Numbers of Agencies	2.1.3, 7.1
(vii) Training Procedures	7.0
(viii) Equipment Testing	6.4
(ix) Drill Types, Schedules, and Procedures	7.3
(x) Plan Review and Update Procedures	8.0
(2) Response Zone Appendix	This Volume
194.113 Information Summary	1.2
(a) Summary in Core Plan	1.2
(1) Name and Address of Operator	1.2.1
(2) Description of Response Zones	Appendices A-1, A-2
(b) Information Summary - Response Zone Appendix	Same - One Zone
194.115 Response Resources	6.0
(a) Identify OSRO's	1.7
(b) Identify Response Resource Capabilities	6.0
194.117 Training	7.0
Section 1 Information Summary	
(a) Core Plan (1) Name and Address of Operator (2) Listing and Description of Each Response Zone	This Volume 1.2.1 1.1, App A-1, App A-2
Response Zone Appendix Information Summary for the Core Plan Name and Telephone Number of QI Description of Response Zone List of Sections in Response Zone Determination of Significant and Substantial Harm Type of Oil and WCD Volume	This Volume 1.2 1.5 1.3, A.1 1.3 1.4 1.2.6

(c) Certification that operator has obtained, through contract or other approved means, the necessary private personnel and equipment to respond, to the maximum extent practicable, to a WCD or substantial threat of such a discharge.	1.7.1 6.1, 6.2, 6.3
Section 2 Notification Procedures	
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(b) Notification Checklist (Prioritized)	2.0
(c) Names of persons to be notified	2.0
(d) Procedures for Notifying QI's	2.0
(e) Primary and Secondary Communications Methods for Notifications	2.1.5
(f) Notifications to Include the Following Information: (1) Name of Pipeline (2) Time of Discharge (3) Location of Discharge (4) Name of Oil Involved (5) Reason for Discharge (6) Estimated Volume of Discharge (7) Weather Conditions on Scene (8) Actions Planned or Taken	2.0
Section 3 Spill Detection and On-Scene Spill Mitigation Procedures	
(a) Methods of Initial Discharge Detection	2.1, App. A-1, App A-2
(b) Procedures to Mitigate further discharge	5.0
(b) List of equipment that may be needed in response activities (1) Transfer hoses and connection equipment (2) Portable pumps and anciliary equipment (3) Facilities available to transport and receive oil	5.0
(d) Location and telephone numbers for use of equipment in response activities	6.0, 7.0
(e) Identification of Personnel, pending arrival of QI or other resources	2.3
Section 4 Response Activities	
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(b) QI responsibility and authority	3.2
(c) Procedures for Coordinating Actions with the OSC	3.3.2, 3.4
(d) Oil Spill Response Organizations available to respond	7.5, 7.6
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Section 5 List of Contacts	
(a) List of required contacts (b) List of QIs (c) List of Insurance Representatives or Surveyors	7.0

Table 1.1 Part 194 Cross Index

1.1.3 Format

The Wickland OSRP provides background and general reference information. It is intended to be used as both a general emergency oil spill response training tool and as an emergency response reference document. It contains information necessary for mobilizing and managing response resources. It also contains condensed guidance in the form of flow diagrams and checklists, notification and mobilization procedures, and lists of individuals and resources comprising the response organization.

1.1.4 Relation to Other Plans/Documents

The Wickland OSCP is intended to be used in conjunction Wickland Pipeline LLC Operation and Maintenance Manual and Operator Qualification Manual. It is also intended to be used with KMEP and Airport Tank Farm OSCPs. These documents are included in this plan by reference. Copies of these plans are maintained at the pipelines Operations Control Centers and at the Wickland Pipelines office and will be made available to qualified individuals, Federal On Scene Coordinators, and others responding to a release.

This plan also references the Sacramento International Airport Jet Fuel Pipeline & Tank Farm Project Draft Environmental Impact Report (March 2001) and the San Jose International Airport Jet Fuel Pipeline Project Initial Study and Mitigated Negative Declaration (July 2009). These references are maintained at the Wickland Office.

1.2 Facility Information Summary

1.2.1 Facility Information

Owner & Operator: Wickland Pipelines LLC
8950 Cal Center Drive Suite 125
Sacramento, CA 95826
(916) 978-2400
(916) 978-2410/2468 (fax)

OPID 31136

1.2.2 Facility Name/Address/Telephone

SMF Pipeline
Wickland Sacramento International Airport Jet Fuel Pipeline
8950 Cal Center Drive Suite 125
Sacramento, CA 95826
(916) 978-2400

SJC Pipeline
Wickland San Jose International Airport Jet Fuel Pipeline
8950 Cal Center Drive Suite 125
Sacramento, CA 95826
(916) 978-2400

1.2.3 Facility Location

(b) (7)(F) [redacted]

SJC Pipeline
(b) (7)(F) [redacted]

1.2.4 Worst Case Oil Discharge

For both the SMF and SJC Pipelines, the worst case discharge (WCD) is calculated as the maximum release time (Detection) in hours, plus the maximum shutdown time in hours (Operators best estimate), multiplied by the maximum flow rate in bbl per hour, plus the largest line drainage (after section isolation) in barrels per 49 CFR 194.105(b)(1). As no historical discharge exists or breakout tanks exist on either pipeline, these methods were not considered.

SMF Pipeline
Calculation of WCD assumes:

(b) (7)(F) [redacted]

- Maximum pumping rate: 5580 bph (3906 gpm)
- Pipeline diameter: 12 in (0.281 in wall thickness)
- Volume per linear foot of pipe: 5.34 gal (0.127 bbl)
- Loss during shutdown (1 min): 3906 gal (93 bbl)

Draindown estimates were calculated for the longest drainable line sections in each line segment. These estimates should be considered as the largest

reasonable theoretical gravity drain down volumes for each segment, since the siphon effect could not reasonably occur on the entire portion of each segment.

(b) (7)(F)

[redacted]

SJC Pipeline

Calculation of WCD assumes:

(b) (7)(F)

[redacted]

- Maximum pumping rate: 1500 bph (1050 gpm)
- Pipeline diameter: 8 in (0.322 in wall thickness)
- Volume per linear foot of pipe: 2.21 gal (0.053 bbl)
- Loss during shutdown (1 min): 1050 gal (25 bbl)

A draindown estimate was calculated for the longest drainable line sections in the SJC Pipeline. This estimate should be considered the largest reasonable theoretical gravity drain down volume of the pipeline, since the siphon effect could not reasonably occur on the entire portion of the pipeline.

(b) (7)(F)

[redacted]

(b) (7)(F) [redacted]

1.3 Response Zones

SMF Pipeline
The SMF Pipeline is divided into three segments, based on valve placement. These segments include:

- SMF Segment 1: (b) (7)(F) [redacted];
- SMF Segment 2: T(b) (7)(F) [redacted] and
- SMF Segment 3: (b) (7)(F) [redacted]

For purposes of this OSCP, all three segments of the SMF Pipeline are considered as a single response zone.

SJC Pipeline
The entire SJC Pipeline is considered to be one segment as there are no in-line valves between the KMEP terminal and the SJC tank farm.

- SJC Segment 1: (b) (7)(F) [redacted]

1.4 Significant and Substantial Harm Criteria

Criteria for pipelines which may cause "Significant and Substantial Harm" to the environment in the event of a release are defined by 49 CFR Part 194. They include those pipelines which meet the following criteria.

SMF Pipeline

- Have a diameter greater than 6 5/8 inches outside diameter;
  Yes (x) No ( )
- Are greater than 10 miles in length;
  Yes (x) No ( )
  and
- Have had a release greater than 1000 bbl within the previous 5 years;
  Yes ( ) No (x)
  or
- Have 2 or more reportable releases in the last 5 years; or contain electric resistance welded pipe manufactured before 1970 that is operated at a level greater than 50% of the lines specified minimum yield strength;
  Yes ( ) No (x)

or

- Are located within a 5 mile radius of a potentially affected drinking water intake;

  Yes ( ) No (None identified)

  or
- Are located within a 1 mile radius of a potentially affected environmentally sensitive area (an area of environmental importance which is in or adjacent to navigatible waters).

  The pipeline predominantly traverses undeveloped land or open agricultural land within the northwest portion of the City of West Sacramento, the eastern portion of Yolo County and the westernmost portion of Sacramento County. It also traverses some developed lands, predominantly where crossings occur (e.g. levees, railroads, and roads), until it reaches the Sacramento International Airport, where it crosses runways and taxiways. The pipeline crosses a navigable waterway (Sacramento River). It also crosses upstream of the Yolo Bypass Wildlife Area. Several species of special concern are potentially located in the area.

  Yes (Potential) No ( )

According to Part 194 criteria, the SMF Pipeline may present "Significant and Substantial Harm" to the environment in the event of a release.

SJC Pipeline

- Have a diameter greater than 6 5/8 inches outside diameter;

  Yes (x) No ( )
- Are greater than 10 miles in length;

  Yes ( ) No (x)

  and
- Have had a release greater than 1000 bbl within the previous 5 years;

  Yes ( ) No (x)

  or
- Have 2 or more reportable releases in the last 5 years; or contain electric resistance welded pipe manufactured before 1970 that is operated at a level greater than 50% of the lines specified minimum yield strength;

  Yes ( ) No (x)

  or
- Are located within a 5 mile radius of a potentially affected drinking water intake;

  Yes ( ) No (None identified)

  or
- Are located within a 1 mile radius of a potentially affected environmentally sensitive area (an area of environmental importance which is in or adjacent to navigatible waters).

The pipeline predominantly traverses developed and undeveloped land with the northern portion of the City of San Jose. The pipeline cross several roads, a railroad spur, and the Guadalupe River.

Yes (Potential) No ( )

According to Part 194 criteria, the SJC Pipeline may present "Significant and Substantial Harm" to the environment in the event of a release.

1.5 Qualified Individuals

SMF Pipeline
Qualified Individuals for the SMF Pipeline are identifies in Table 1.2.

No.	Name	Day Phone	After Hours
1	Myles Butler	916 710-0287	707 224-3682
2	Roy Wickland	916 978-2450	916 425-3585
3	Dan Hall	916 978-2460	916 813-1917

Table 1.2. SMF Pipeline Qualified Individuals

SJC Pipeline
Qualified Individuals for the SJC Pipeline are identifies in Table 1.3.

No.	Name	Day Phone	After Hours
1	Rick Carpenendo	408 894-9151	408 759-2290
2	Matt Wickland	916 978-2480	510 258-2662
3	Myles Butler	916 710-0287	707 224-3682

Table 1.3. SJC Pipeline Qualified Individuals

1.6 Statement of Consistency

This OSCP has been prepared in accordance with the National Contingency Plan (NCP; 40 CFR Part 300) and is believed to be consistent with its provisions. It has also been designed to be consistent with the applicable local Area Contingency Plan (ACP).

To determine the location of environmentally and economically sensitive areas at risk along the routes of the SMF and SJC Pipelines, the California State Oil Spill Contingency Plan (CSOSCP) was utilized. The CSOSCP references the 2011 Sector San Francisco ACP Volume II Section 9800 to determine the sites identified as environmentally and economically sensitive. The ACP covers three main areas, including the San Francisco Bay and Delta. This ACP includes the two counties (Yolo and Sacramento) within which the SMF Pipeline ROW is

situated and the one county (Santa Clara) in which the SJC Pipeline ROW is situated. As part of the SF Bay and Delta ACP, multiple Geographic Response Areas are identified. Based on the maps for GRA 8 and GRA 3, which represent the areas closest to the SMF and SJC Pipelines, respectively, no environmentally or economically sensitive areas are located along or nearby the SMF Pipeline ROW or the SJC Pipeline ROW.

1.7 Response Organization Contract

1.7.1 Certification of Resources

Wickland Pipelines LLC certifies that it maintains an emergency response agreement with a spill response organization that it believes is capable of responding to Worst Case Discharges as identified in this OSRP.

1.7.2 Primary Emergency Response Contractor

Wickland has entered into an agreement with NRC Environmental Services for provision of Primary Emergency Spill Response services for the SMF and SJC Pipeline segments. A copy of this contract is provided in Section 6.3.

1.7.3 Wildlife Response Organization

Wickland intends to utilize the services of the University of California Davis Oiled Wildlife Care Network (OWCN).

1.8 Limitations

The Wickland Pipelines OSCP provides guidance for planning and response to oil spills, including suggested first response actions. It is recognized, however, that all oil spills are unique events, and each incident will require individual assessment and development of response actions specific to the conditions encountered at the time of the event. Guidance and recommendations presented in this OSCP are based on historical oil spill response experience and evaluation of typical conditions in the response area. However, they are not meant to replace case-by-case evaluation or use of common sense.

2.0 NOTIFICATIONS AND MOBILIZATION

2.1 Discovery

Initial spill reports may be received from a number of different sources: The Wickland Pipelines leak detection system may detect incidents instrumentally; by routine ROW inspections; through employee observations; by adjacent operators, or by third parties. Signs providing emergency call-in numbers are placed at strategic locations on Wickland facilities and pipeline markers. Emergency call-in numbers will be manned 24 hours per day.

Emergency Call-in Number: 916 978-2477

2.2 Incident Confirmation

Wickland will respond to any credible report of a spill associated with its operations. The level of response will depend on whether the spill report has been confirmed or not.

- Confirmed Spill. A confirmed spill is one where leakage of oil has been visually confirmed by Wickland employees, contractor personnel, or other reliable source. The Wickland OSRP and appropriate resources will be activated immediately whenever a spill report is confirmed.

- Unconfirmed Spill. An unconfirmed spill is typically a third-party report or instrument indication that has not been confirmed, as above. An assessment team will be dispatched to locate and confirm the spill. Response resources will be placed on alert while this assessment is conducted. For instrument indications of major rupture (e.g. pipeline pressure decay, high inventory mass imbalance) resources will be dispatched immediately, regardless of confirmation status.

2.3 Wickland Internal Notifications

The general notification sequence is determined by the source of the initial report and the apparent severity of the incident. The Wickland Notification Sequence is shown in Figure 2.1.

On receipt of an incoming report, the Emergency Operator will:

- Complete an Initial Information Checklist (Figure 2.2); and

- Contact the Pipeline Operators, Wickland Qualified Individuals, and Wickland management.

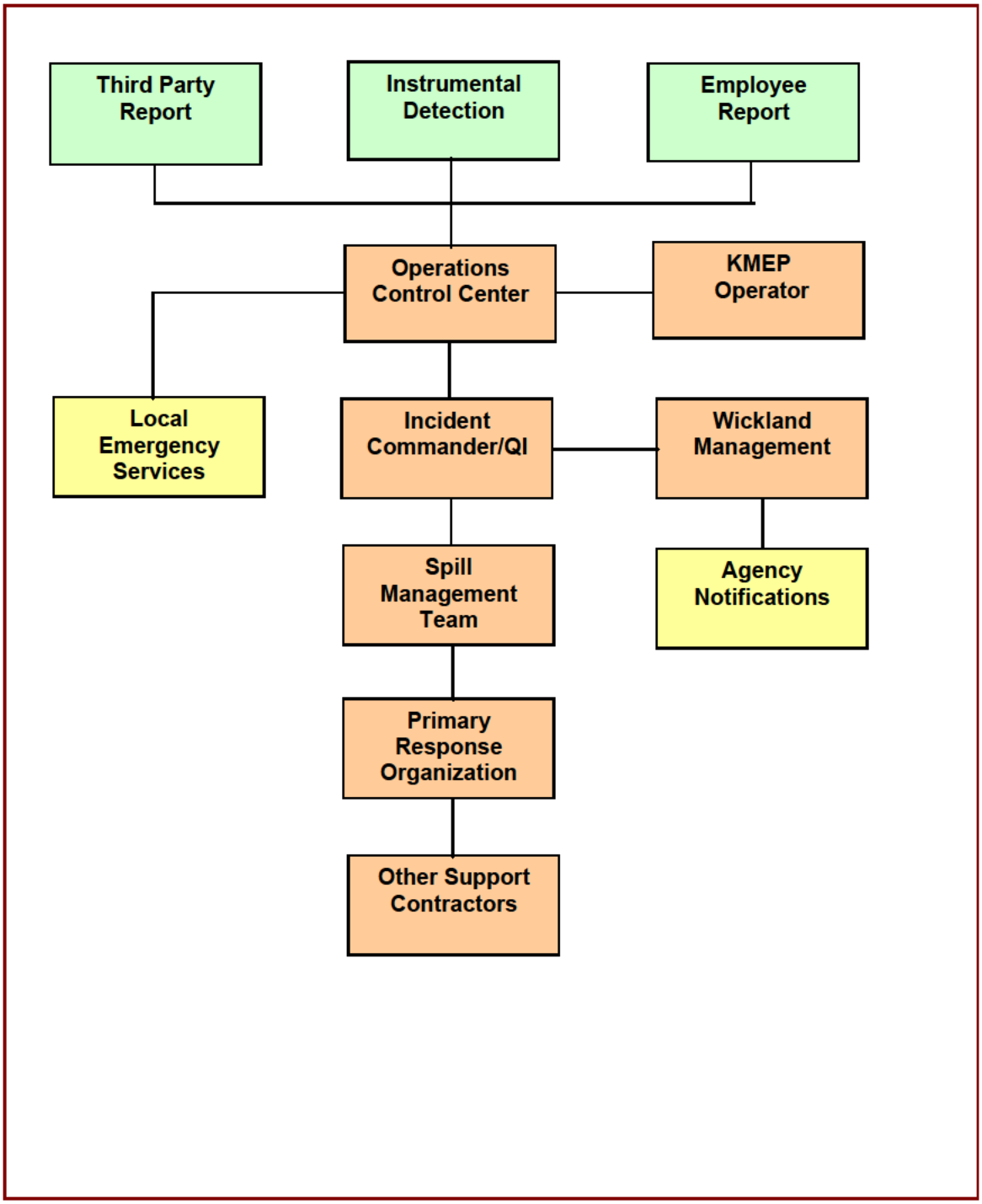

Figure 2.1 Typical Notification Sequence

INITIAL INCIDENT DATA

FILL OUT THIS FORM AS COMPLETELY AS POSSIBLE BEFORE NOTIFYING AGENCIES. HOWEVER, DO NOT DELAY NOTIFICATION IN ORDER TO COLLECT ALL INFORMATION ON THIS CHECKLIST. WHEN REPORTING INFORMATION BE AS CONCISE AS POSSIBLE AND DO NOT SPECULATE.

Caller's Name and Title:_____
Caller's Phone Number:_____
Release Location:
City_____
Address/Intersection_____
Pipeline Marker_____
Other Descriptor_____
Date and Time of Incident:
Occurrence_____
Discovery_____
Injuries_____
Fire/Explosion_____
Cause of Release:
_____
_____
_____
Release is (Check): Instanteous _____Continuing _____Threatened_____
Estimated Quantity Released / At Risk: _____
Material Released To: Ground_____Water_____Subsurface_____
Estimated Amount Spilled to Water:_____
Appearance of Sheen / Slick (Size, location, movement):
_____
_____
_____
Weather Conditions:
_____
_____
Sensitive Areas At Risk:
_____
_____
_____
_____
Actions / Plans:
_____
_____
_____
_____

On Site: FD_____Police_____Other_____
Information Taken By:
Name_____Date_____

Figure 2.2 Initial Incident Data Checklist

The following procedure will then be followed:

- The Pipeline Operator will contact 911 if appropriate.

- The Pipeline Operator is responsible for notification of the Wickland Incident Commander and Qualified Individual. Wickland and its operator rotate SRT assignments. Current 24-hour contact information for Spill Response Team (SRT) members and QIs are maintained on the operations computer system. A hard copy of current assignments is posted at the Pipeline Operator's desk.

- The Incident Commander is responsible for notification and callout of the spill response team and contractors. The Incident Commander is also responsible for ensuring that notification of appropriate government authorities is completed.

2.4 Notification of Authorities

Immediate notification of government Agencies is required following the discovery of a release resulting in an event described in 49 CFR 195.50 and 49 CFR 195.52, which includes an event causing death or personal injury requiring hospitalization; a fire or explosion not intentionally set; estimated clean up and recovery costs exceeding $50,000; or pollution of any stream, river, lake, reservoir, or other body of water that violates applicable water quality standards, causes discoloration of the surface of water or shorelines, or deposits sludge or emulsion beneath the surface of the water or adjoining shorelines.

Wickland will conduct required notification of government Agencies within a two (2) hour timeframe as follows:

Federal: National Response Center (800) 424-8802
State: OSPR (916) 445-0411
Sacramento County OES (916) 845-8470
Santa Clara County OES (408) 808-7800
California OES (800) 852-7550

Federal reporting can also be made on-line using a form designed specifically for reporting pipeline incidents. NRC online reporting can be conducted at: **http://www.nrc.uscg.mil/pipelinereport.html**

Do not delay notifications / reporting if all information is not available. If you are uncertain regarding any information, do not speculate (particularly with reference to cause). Also, it is inappropriate to estimate damages in dollars at this stage of the response. The NRC will issue a report number; be sure to record it. Do not use on-line reporting if terrorism is the suspected cause of the release – REPORT VERBALLY USING 800 NUMBER.

2.5 Adjacent Industry

SMF Pipeline

A Pacific Gas & Electricity gas pipeline is located adjacent to part of the SMF Pipeline. In the event of a release near PG&E facilities, Wickland will notify PG&E of the location and potential nature of the incident. The PG&E emergency contact telephone number is 1-800-PGE-5000.

The northern end of the pipeline crosses under runway of the Sacramento International Airport (SMF) and terminates at the airport tankfarm. The emergency telephone numbers include:

Airport Communications Center (916) 292-5000 (24 hrs)

Sacramento County Sheriffs Dept (Airport Division) 911 or
(916) 874-0675

- Metering Station:

To the north: Union Pacific Railroad
33 Bridgehead Road
Martinez, CA
(510) 891-7862 or (916) 799-4876

To the east: Natoma's Towing
3982 Commerce Drive
West Sacramento, CA
(916) 374-8166

To the south: Estes Terminals
4200 West Capitol Ave.
West Sacramento, CA
(916) 715-0016

To the west: Estes Terminals
4200 West Capitol Ave.
West Sacramento, CA
(916) 715-0016

SJC Pipeline

A Pacific Gas & Electricity gas pipeline is located adjacent to part of the SMF Pipeline. In the event of a release near PG&E facilities, Wickland will notify PG&E of the location and potential nature of the incident. The PG&E emergency contact telephone number is 1-800-PGE-5000.

The SJC Pipeline's pump and launcher skids are contained within the Kinder Morgan Energy Partners terminal in San Jose and the receiver skid is within the SJC Fuel Company tank farm near the SJC airport. The emergency telephone numbers include:

Kinder Morgan Energy Partners: (408) 435-7399

SJC Fuel Company: (408) 324-0730

2.6 Communications Methods

Primary emergency communications will utilize standard telephone services and cellular communications. Response Organization VHF communications equipment will be used for secondary communications, as appropriate.

3.0 RESPONSE ORGANIZATION

3.1 General

The Wickland's spill response organization is designed using principles of the Incident Command System (ICS), adapted to meet organizational needs. The ICS was developed to manage response to wildfires, and has been recognized and adopted by most agencies (including the State of California and the federal government) for oil spill response. Through the use of a Unified Command, Wickland shares the command and decision-making role with designated local, state and federal agencies.

Initial response actions will focus on system shutdown, public safety, assessment and initial containment activities. These actions will be initiated primarily by on-duty personnel and contractors in coordination with local emergency services, as appropriate. For small spills, initial response actions may be all that is needed. For larger releases, additional resources may be activated as necessary, requiring activation of Wickland's Spill Management Team.

3.2 Qualified Individuals

Wickland has identified and trained a number of Qualified Individuals (QI). All Wickland Qualified Individuals are English-speaking employees and are familiar with the location and operation of the SMF and SJC Pipeline Systems and the information provided in this plan. A Qualified Individual is available on-call by telephone and/or pager on a 24 basis. General Qualified Individual authority and responsibility includes:

- Activating and engaging with an Emergency Response Organization and other spill response support organizations; and
- Obligating, either directly or through prearranged contracts, funds required to carry out all necessary or directed response activities.

The current listing of Wickland Qualified Individuals is provided in Section 1.5.

Qualified Individual authority to authorize expenditures is commensurate with the magnitude of the event.

3.3 Spill Management Team (SMT)

3.3.1 Organization

Wickland's Spill Management Team is shown in Figure 3.1. This team may be staffed by Wickland employees or contractors, as required. Multiple functions may be conducted by individuals for most anticipated events. Color-coded designations and alphanumeric codes refer to general position/function descriptions provided in the following section. The current rotation list for the SMT is maintained by the pipeline operator at the pipeline Control Center. Activation of the SMT positions will be determined by the needs of each incident.

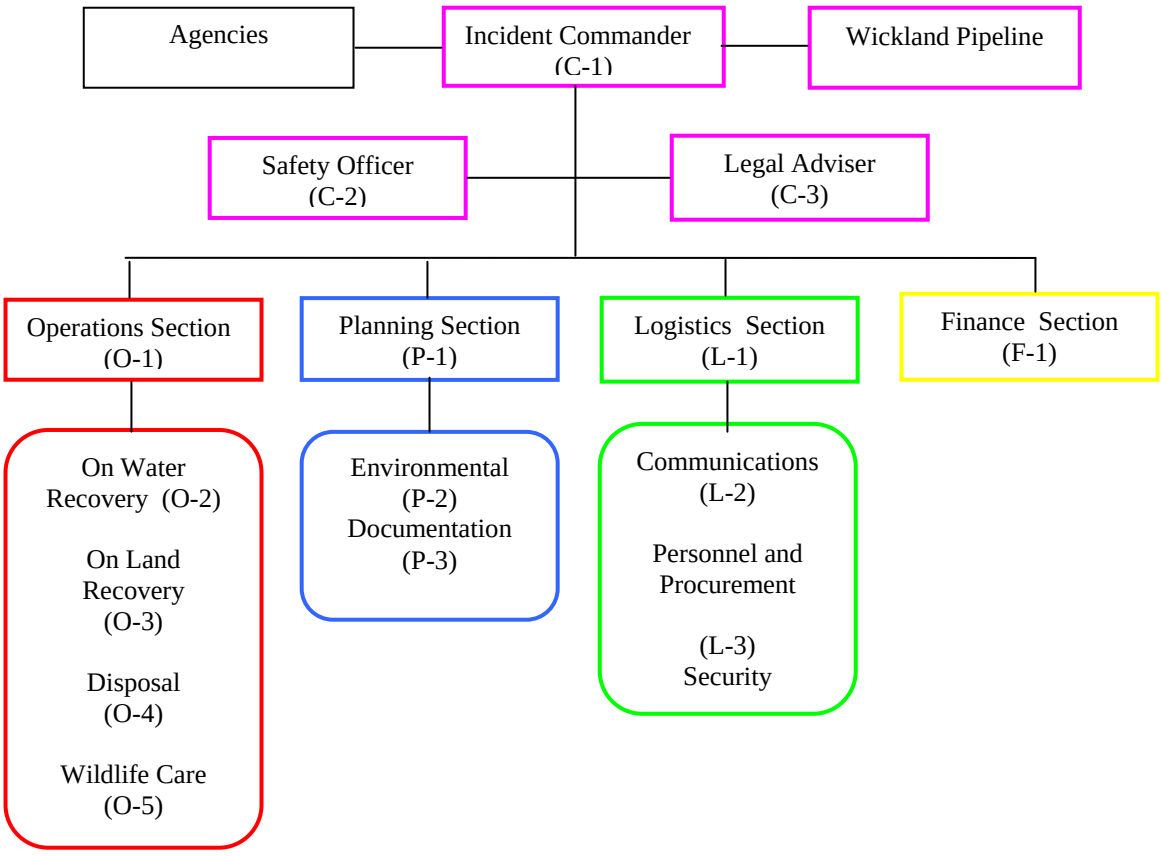

Figure 3.1 Wickland Spill Management Team Organization

3.3.2 Roles and Interaction of SMT, Response Organization. Local Emergency Services and Agencies

The initial Incident Commander may be provided by the local fire department until Wickland's SMT arrives on scene. Wickland will cooperate and coordinate initial response activities with the initial Incident Commander until such time as a spill response command is established. When a spill response command is established, Wickland and its operator will provide a Command staff, Operations, Planning, Logistics and Finance Section Chiefs. Operator personnel and spill response contractors will typically fill other positions on the Spill management Team. Issues involving public safety will be coordinated with the appropriate

agency. Wickland and its operator will coordinate and work cooperatively with agencies and agency personnel to the extent practical.

3.3.3 SMT Position Descriptions

Wickland's response organization is based on the Incident Command System (ICS). Several positions have been adapted to match Wickland's resources and the probably nature of typical spill response requirements. General scope, duties, and responsibilities for SMT positions are described in the following section. Position descriptions are numbered and color coded to correspond to Figure 3.1. It is recognized that each incident will have unique requirements, and that the actual scope for any position may require adjustment to meet the needs of the situation.

C-1 INCIDENT COMMANDER

C-1

INCIDENT COMMANDER

SCOPE

Responsible for setup of Incident Command and all Wickland/Operator activities related to the response effort. Approves and supervises implementation of the Incident Action Plan for Wickland/Operator.

DUTIES AND RESPONSIBILITIES

Pre-Event
Ensure that Wickland resources (designated employees and contractors) are familiar with the provisions of the emergency response plan and their specific roles and responsibilities.
Ensure that spill response training is current and that designated resources have required certifications and licenses.
Maintain periodic contact with contracted response organization(s), local emergency service representatives and primary responsible agency representatives.
Ensure that all Wickland spill response equipment is properly inspected, maintained and operational.

During Event
Obtain initial situation report; alert/activate resources as necessary.
Ensure that highest priority is given to public safety, safety of company personnel, and protection of public and private property.
Work with public agencies and trustees in setting up an Incident Command.
Coordinate all activities involving public agencies, trustees and media relations.
Work with the IC to develop strategic objectives and response priorities.
Set Schedule, conduct daily meetings, and approve Incident Action Plans.
Supervise all Wickland response activities to ensure consistency with company policy and IC directives.
Review response procedures and effectiveness and work with the IC to implement changes as appropriate.
Coordinate and approve all company press releases and statements.
Approve the demobilization plan.

Post-Event
Coordinate preparation and review of Incident Summary Report.
Conduct after-action review of response and recommend modifications to Wickland's response plans and/or resources as appropriate.
Ensure that all response equipment has been maintained, repaired, and/or replenished, as appropriate.
Update OSCP as appropriate.

C-2 SAFETY OFFICER

C-2

SAFETY OFFICER

SCOPE

Develop and manage operations safety program and provide technical advice on safety, industrial hygiene, and toxicology as required.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Become familiar with health and safety-related aspects of the materials handled and used during spill response and environmentally related safety issues.

During Event
Develop and implement a site safety plan.
Provide the Planning Section with health and safety massages for inclusion in the Incident Action Plan.
Coordinate health and safety related communications by developing and issuing safety bulletins, alerts, etc. on issues affecting or likely to affect worker/public safety.
Monitor contractors for conformance with safety requirements and associated record keeping.
Record safety-related accidents that occur during response operations.
Ensure compliance with all relevant OSHA requirements.
Locate, setup, and ensure that first aid stations are manned.
Institute and supervise exposure monitoring, Hazard Communication compliance, respiratory protection, and selection of appropriate protective clothing/
Ensure that the proper PPE and instructions regarding use are available to response personnel.
Ensure that decontamination facilities are setup and operational during the response effort.
Assist the Information Officer / Liaison Officer in describing any toxic hazards to the public.
Maintain records of activities, including Activities Log (ICS 214) or equivalent.

Post-Event
Summarize notes and records and assist with the preparation of the Incident Summary Report.
Conduct an after-action review of safety activities and recommend modifications to Wickland's response plans and/or resources, as appropriate.

C-3 LEGAL ADVISOR

SCOPE

Provide legal advice in support of response operations, and anticipate information requirements for potential legal actions resulting from the spill. Ensures that information relevant to the defense and/or settlement of future claims is gathered and preserved.

DUTIES AND RESPONSIBILITIES

Pre-Event
Be familiar with Wickland Pipeline's OSCP and the responsibilities of this position.
Track regulatory requirements associated with spill response and periodically review Wickland OSCP for compliance.
Maintain a working familiarity with NRDA regulations.
Identify and maintain a listing of outside counsel and technical support for specialized areas such as NRDA.

During Event
Assist Wickland IC in developing working relationships with Agencies, draft and secure Memorandum(s) of Understanding with Agencies as appropriate.
Work with Trustees to establish need for NRDA and level of expected cooperation; draft and obtain MOU.
Determine / establish Wickland legal relationship with other involved parties.
Provide advice on the type of information needed to support Wickland in incident-related litigation.
Assist in establishing and implementing third-party settlement procedures and arranging for adjustment assistance.
Assist the Public Relations and Claims representatives in preparing responses to inquires regarding claims and other legal issues.
Review contracts, if necessary.
Provide legal advice on response operations.
Ensure that response personnel restrict communications related to liability or fault that may otherwise hinder future legal proceedings.
Assist the Personnel and Procurement Unit in the event of injuries or fatalities associated with the response.
Maintain records of activities, including Activities Log (ICS 214) or equivalent.

Post Event
Assist the Incident Commander in the preparation and review of the Incident Summary Report.
Conduct an after-action review of response activities and recommend modifications to Wickland's response plans and/or resources, as appropriate.

O-1 OPERATIONS SECTION CHIEF

O-1

OPERATIONS SECTION CHIEF

SCOPE

Manage all operations related to the containment and recovery of spilled oil, and cleanup and restoration operations.

DUTIES AND RESPONSIBILITIES

Pre-Event
Be familiar with Wickland Pipeline's OSCP and the responsibilities of this position.
Maintain contact with primary response organizations and other support contractors, and local emergency response representatives.
Be familiar with pre-planned response procedures for key sensitive areas.

During Event
Obtain briefing from Pipeline Operator and activate appropriate level of response.
Conduct tactical operations planning meetings (review strategic objectives and response priorities, devise response strategies).
Supervise the development and implementation of tactical operations.
Ensure that operations personnel have the equipment, materials and manpower needed to carry out response assignments.
Ensure that all actions are consistent with company policies and appropriate agency regulations and directives.
Keep the Incident Commander informed of changing conditions.
Participate in Incident Planning Meetings, as required.
Coordinate response operations carried out by company, response organizations, contractors, and agencies.
Handle the release/reassignment of response resources when they are no longer needed.
Ensure that the Finance Section is advised of all cost commitments.

Post Event
Participate in the development of the Incident Summary Report and any other required reports.
Ensure that all Wickland equipment has been repaired, serviced, and returned to storage, and that all expendable resources have been restocked.
Conduct an after-action review of response operations and recommend modifications to Wickland's response plans and/or resources, as appropriate.

O-2 ON WATER RECOVERY

SCOPE

Manage on-water containment and recovery operations.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Become familiar with general conditions in the proximity of the pipeline ROW (Sacramento River, Guadalupe River) as they pertain to navigation and booming/skimming operations.
Ensure that all on-water response resources are maintained and available.

During Event
Proceed to general area of concern and determine precise spill location and characteristics; report immediately.
Coordinate with local emergency services on arrival, evaluate safety issues, and conduct evacuations if necessary.
Assign specific duties to staff; supervise staff; determine resource needs and request assistance, if necessary.
Initiate containment and control actions as close to source as feasible.
Participate in incident planning meetings as requested.
Direct additional resources as they arrive.
Implement daily Incident Action Plan directives.
Monitor and maintain all deployments, including regular removal of impounded material.
Mark/light any static deployments which may represent navigational hazards.
Recommend alternate containment and recovery procedures as appropriate.
Review/approve daily time and equipment usage cards.
Maintain Unit records and logs (ICS 214 or equivalent).

Post Event
Assist in the preparation of the Incident Summary Report
Conduct an after-action review of unit operations and recommend modifications to Wickland's response plans and/or resources, as appropriate.

O-3 ONSHORE CLEANUP

SCOPE

Implement onshore containment and recovery operations, including pre-determined initial response actions and actions specified in the Incident Action Plan. Onshore includes both shorelines and inland areas.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Become familiar with the pipeline alignments, truck routes and potentially impacted land areas.
Become familiar with safety aspects of the potentially spilled materials.
Ensure that response resources are available and maintained.

During Event
Assist in the initial location of the release and assessment of movement and damages.
Report to initial OSC (Usually the Fire Department for land spills) for briefing and direction, if applicable.
Ensure that appropriate measures are taken for protection of the public and response workers; coordinate with local emergency services, as necessary.
Assign specific duties to staff; supervise staff; determine resource needs and request assistance, if necessary.
Implement pre-planned containment and control actions, as appropriate.
Implement actions specified in Incident Action Plan.
Maintain Unit records and logs (ICS 214 or equivalent).

Post Event
Assist in the preparation of the Incident Summary Report.
Conduct and after-action review of Unit operations and recommend modifications to Wickland's response plans and/or resources, as appropriate.

O-4 DISPOSAL

SCOPE

Supervise all waste handling, disposal and recycling operations. Identify and implement most cost-effective and environmentally acceptable options for management of spill generated materials. Assist with obtaining expedited and other permits, as required.

DUTIES AND RESPONSIBILITIES

Pre-Event
Be familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Maintain an active file of waste disposal and recycling options in California.

During Event
Estimate need and capacities of temporary material handling sites and convey information to Disposal Unit; review calculations periodically.
Determine if adequate tankage is available for storage of recovered fluids.
Identify disposal, treatment and recycling alternatives and contractors in California
Assist with identification and contracting of licensed waste management contractors.
Assist with obtaining any expedited or other permits needed.
Participate in incident planning meetings, as requested.
Ensure that all appropriate record keeping, including waste manifests and logs, is being conducted.
Categorize waste streams generated by the response, and recommend segregation, if appropriate to improve handling capabilities and reduce disposal/treatment costs.
Develop and implement a program to quantify oil recovery.

Post-Event
Provide summaries of waste management activities for inclusion in Incident Summary Report.
Review contractor invoices.
Conduct an after-actions review of activity, and recommend modifications to Wickland's response plans and/or resources, as appropriate.

O-5 WILDLIFE CARE

SCOPE

Collect, clean, rehabilitate, and return impacted wildlife species of concern, or those collected by third parties.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with the requirements of this position.
Establish and maintain a contract(s) with a qualified wildlife care organization(s).
Establish liaison with state and federal wildlife representatives.
Develop and maintain a list of potential temporary wildlife rehabilitation facility options.

During Event
Establish temporary wildlife reception, triage, and rehabilitation facilities in general proximity to spill location.
Assign specific duties to staff; supervise staff; determine resource needs and request additional assistance, if necessary.
Coordinate use of volunteers, if any, with state and federal representatives.
Work with wildlife trustees to establish priorities and collection/rehabilitation criteria.
Establish a wildlife "hotline" and refer callers to collection centers or agencies for volunteer work (Wickland cannot be responsible for employment or management of volunteer assistance).
Assist state and federal trustees with transportation of injured wildlife.
Prepare daily summary of animals recovered and animals treated for presentation to IC and other interested parties; participate in incident planning meetings, if requested.
Keep accurate records regarding species and numbers of wildlife collected, numbers treated, procedures used, survival/release statistics, and expenditures.
Assist the state with preservation of dead organisms.
Report all cost commitments and/or expenditures to Finance Section on a regular basis.
Maintain Unit records and logs (ICS 214 or equivalent).

Post Event
Prepare summary report outlining procedures used, collection counts, and survival statistics for inclusion in the Incident Summary Report.
Conduct and after-action review of Unit operations, and recommend modifications to Wickland's response plans and/or resources, as appropriate.

P-1 PLANNING SECTION CHIEF

P-1

PLANNING SECTION CHIEF

SCOPE

Supervise the collection, evaluation, and dissemination of information; analyze data and recommend future actions.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Maintain a current list of available support contractors and services.
Establish and maintain stand-by contracts with essential services providers.

During Event
Establish a Planning Section location at the Command Center.
Assign specific duties to staff; supervise staff; determine resource needs and request additional assistance, if necessary.
Supervise the preparation and distribution of daily incidents actions plans, status reports, and other incident-specific information.
Ensure that systems are established that will facilitate the collection, evaluation, analysis, and dissemination of information and data (including weather, spill movement, status of response resources, etc.).
Ensure that all necessary resources are available for the collection of ephemeral data needed to conduct response operations (spill movement and behavior, areas impacted, water quality, etc.).
Provide the Incident Command with accurate and up-to-date information on the response effort.
Participate in incident planning meetings.
Coordinate the efforts of Wickland response personnel and Agency participants in the response, and assist in the preparation of responses to requests for information from government agencies.
Ensure that the Finance Section is advised of all cost commitments.
Maintain Unit records and logs (ICS 214 or equivalent).

Post Event
Coordinate input from Planning Section for the preparation of the Incident Summary Report.
Conduct an after-action review of Section response and recommend modifications to Wickland's response plans and/or resources, as appropriate.

P-2 ENVIRONMENTAL

SCOPE

Coordinate environmental components of the spill response, including resource evaluation, spill fate and behavior, modeling, sampling, documentation, impact assessment, wildlife issues and related issues. Coordinate activities with parallel efforts of Agencies and NRDA efforts as appropriate.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Maintain an internal company file containing information on environmental conditions, cultural, historical, archeological, or paleontological sites identified along or adjacent to the pipeline ROW and local area..
Maintain a current listing of qualified environmental support contractors.

During Event
Assign specific duties to staff; supervise staff; review resource needs and request additional assistance, if necessary.
Identify sensitive resources at risk, determine potential impacts of oil and set priorities.
Forecast spilled oil movements, fate and behavior (streams, open water, storm drains, on land, subsurface).
Initiate and manage Shoreline Cleanup Assessment Team (SCAT) Provide daily reports to Operations.
Arrange for collection and assessment of water quality, air quality, hydrology, human health and other subjects as appropriate. Coordinate data collection efforts and ensure that results are provided to Incident Command (and NRDA, if applicable) in a timely fashion, and that all studies are properly documented.
Liaison with Scientific Support Coordinator (SSC), Natural Resource Trustees, and other federal, state, and local agencies.
Obtain necessary permits or variances for response operations.
Participate in incident planning meetings , as requested
Develop plans and support needs for Environmental Unit activities for inclusion in Incident Action Plans.
Develop an approach for coordination and data sharing with any NRDA or pre-NRDA program
Identify, contract, and supervise technical experts, and other outside support services as needed.
Maintain Unit records and logs (ICS 214 or equivalent).

Post Event
Assist in the preparation of the Incident Summary Report, as requested.
Conduct an after-action review of Unit activities and recommend modifications to Wickland's response plans and/or resources, as appropriate.

P-3 DOCUMENTATION

P-3

DOCUMENTATION

SCOPE

Maintain accurate and complete incident files, provide duplication services to incident personnel, and document planning/briefing meetings.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Review past incidents and consult with Legal Officer and identify general documentation requirements.

During Event
Working with Legal Officer, develop incident-specific documentation guidelines for distribution to response management personnel.
Assign specific duties to staff; supervise staff; determine resource needs and request additional assistance, if necessary.
Distribute logbooks to response personnel.
Establish a filing system for incident files. Distribute copies of the file index to appropriate response personnel.
Duplicate and file all official forms and reports.
Check records for completeness and accuracy prior to filing.
Maintain Unit records and logs (ICS 214 or equivalent)

Post Event
Organize and inventory incident documentation and provide to Legal Officer and Incident Commander for inclusion in the Incident Summary Report.
Conduct an after-action review of Unit activities and recommend modifications to Wickland's response plans and/or resources, as appropriate.

L-1 LOGISTICS SECTION CHIEF

L-1

LOGISTICS SECTION CHIEF

SCOPE
Responsible for obtaining facilities, equipment, materials, transportation, communications systems, medical services, security services, housing, food and other materials necessary to support response activities.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Maintain current listing of vendors for required support services.

During Event
Work with Incident Commander and Section Chiefs to identify and obtain necessary manpower and support services (as identified in the IAP), including:

- facilities
- vessels, aircraft and land vehicles
- communications equipment
- medical services
- security services
- food and sanitary support
- Other as required.

Assign specific duties to staff; supervise staff; review needs and request additional assistance, if necessary.
Ensure that logistics, support, and service needs are met in a manner that maximizes personnel safety.
Ensure that guidelines, procedures, forms, and data management systems to monitor and control equipment inventories are followed.
Ensure that maintenance services are provided for all equipment utilized.
Ensure that records are maintained on services provided and contracts executed.
Provide Operations Section with recommendations on the timing and release of services and/or equipment no longer being utilized.
Participate in incident planning meetings as requested.
Ensure that the Finance Section is advised of all cost commitments.
Develop procedures for tracking and accounting for subcontracted equipment.

Post Event
Work with Logistics Units to provide information for inclusion in the Incident Summary Report.
Conduct an after-action review of Section activities and recommend modifications to Wickland's response plans and/or resources, as appropriate.

L-2 COMMUNICATIONS

SCOPE
Establish, operate and maintain an effective integrated communications network.
DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.
Establish communications requirements and procedures with local emergency services and primary response organizations.
Identify internal and external sources of communications equipment and support services.
Ensure that internal communications equipment is accessible and operational.

During Event
Contact the IC to evaluate and establish communications priorities
Setup and operate emergency communications center at the Command Center
Conduct a location survey of available communications systems
Establish "hot lines" as necessary
Obtain special permits, FCC Special Temporary Authorizations, Communications site rentals, and other services related to the communications network.
Provide and supervise technical staff necessary for 24 hour communications support, including installations, maintenance, change-out, and removal or equipment.
Keep IC informed as to the status of any communications problems, or lack of equipment that could affect the incident response.
Participate in incident planning meetings, as requested.
Ensure that records are maintained on communications equipment distributed during the response (obtain, issue, and track all portable or other equipment).
Set up a central location for issuing and recharging radio batteries.
Provide training on the use of radios or other issued equipment.
Ensure that the Finance Section is advised of all cost commitments.
Man central communications at command center, or as directed, keep logs of all communications traffic.
Set up communications for PR center and other special facilities as requested and approved by the IC
Maintain adequate records, communications logs and activity logs (ICS 214 or equivalent).

Post Event
Test and repair all emergency response equipment, replace as necessary.
Account for and return all leased or rented communications equipment.
Assist in the preparation of the Incident Summary Report, as requested.
Conduct an after-action review of Unit activities and recommend modifications to Wickland's response plans and/or resources, as appropriate.

L-3 PERSONNEL & PROCUREMENT

SCOPE

Responsible for establishing and effective purchasing, procurement network.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.

During Event
Establish a schedule and procedure for implementing requests from the IAP.
Assign specific duties to staff; supervise staff; review resources and recommend modifications to Wickland's response plans and/or resources, as appropriate.
Interface with members of the SMT to establish a procedure and location for requesting other equipment, materials and supply needs.
Locate, order, receive and store equipment and supplies.
Prepare purchase orders and service contracts.
Maintain files on contracts, equipment rentals, and purchase orders so that charges can be validated.
Work with the Logistics Section to arrange the quickest and most cost-effective transport of equipment and supplies to staging areas and/or point of use.
Work with the Finance Section on tracking all equipment, materials, and supplies.
Establish a system to track equipment, materials and supplies en route to the spill scene, including ETA at final destination.
Establish a central receiving and inspection location for equipment and supplies. Work with the Personnel and Procurement Unit to ensure that adequate warehouse space is available.
Establish an inventory system for equipment, materials and supplies stored at the central receiving point.
Ensure that equipment and supplies received are undamaged, maintained and ready for use.
Keep Finance Section informed as to the status of purchasing activities, including any shortfalls that could adversely affect the response effort.
Maintain adequate records and logs (ICS 214 or equivalent).

Post-Event
Participate in the preparation of the Incident Summary Report, as requested.
Conduct an after-action review of this Units operations and recommend modifications to Wickland's response plans and/or resources, as appropriate.

L-4 SECURITY

L-4

SECURITY

SCOPE

Security is responsible for providing safeguards needed to protect response personnel, facilities and equipment from loss and/or damage.

DUTIES AND RESPONSIBILITIES

Pre-Event
Be familiar with Wickland Pipeline's OSCP and specific requirements of this position.

During Event
Obtain a briefing from the Logistics Section Chief and local law enforcement agency(s) to determine nature location(s) of all response operations and security requirements.
Establish security controls at Command Center.
Contact Agency Representatives to discuss any special custodial requirements which might affect operations.
Develop Security Plan for incident, including site security, access and traffic control, and other measures.
Evaluate need for personnel badges and facility access control.
Coordinate security activities with appropriate incident personnel.
Document and investigate all complaints and issues relater to incident security, make recommendations for actions to correct problems.
Maintain activity records and logs (ICS 214 or equivalent).

Post-Event
Provide summary of security measures employed and documentation of all complaints/issues and their resolution for inclusion in the Incident Summary Report.
Conduct an after0action review of activity and recommend modifications to Wickland's response plans and/or resources, as appropriate.

F-1 FINANCE SECTION CHIEF

SCOPE

Manage the financial and administrative aspects of the incident response.

DUTIES AND RESPONSIBILITIES

Pre-Event
Become familiar with Wickland Pipeline's OSCP and the specific requirements of this position.

During Event
Assign specific duties to staff; supervise staff; determine resource needs and request additional assistance, if necessary.
Provide the Incident Commander with information on the financial implications of actions taken or anticipated.
Ensure that appropriate cost and accounting control systems are established and properly utilized.
Provide accounting systems, including auditing, billing, and labor documentation, and other materials and services used.
Maintain and on-going estimate of expenditures and any available projections. Provide this information to the Incident Commander and Wickland management as requested.
Participate in incident planning meetings as requested.
Implement effective and timely disbursement capabilities. Coordinate invoice verifications, appropriate charge coding, and system input.
Establish a cash working fund and local banking facilities as needed.
Develop expenditure approval limits.
Capture actual costs as they are committed and paid.
Ensure that claims and insurance matters are properly handled.

Post-Event
Assist in the preparation of the Incident Summary Report.
Conduct an after-action review of Section activities and recommend modifications to Wickland's response plan and/or resources, as appropriate.

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3.3.4 Volunteers

Concerned citizens and organizations may volunteer their services in the event of a release. In general, volunteer resources do not have the specialized health and safety training necessary for activities involving exposure to aviation turbine fuel or spill response operations. In addition, Wickland does not maintain insurance coverage for these types of activities. Direct use of volunteers by Wickland for cleanup activities is therefore, not advisable or possible. However, volunteers may be used be used for activities such as shoreline surveillance and some aspects of wildlife care. Use of volunteers for such duties may be acceptable, providing they are organized and managed through a regulatory agency. Wickland will support Agency Management of volunteers, with such support including establishment of a volunteer referral process or telephone "hotline" and provision of appropriate equipment and transportation.

3.4 The Incident Command System

3.4.1 ICS Overview

Application of the Incident Command System has become the Agency and Industry standard management approach for oil spill response in the United States, and has been adopted by Wickland in the design of its Spill Management Team. ICS is designed to be responsive to the changing needs of any spill response, and in general will be initiated with limited resources that can be added to over time as the situation evolves. The following guidance is provided to facilitate the initial establishment of an Incident Command, with the understanding that modifications, either up or down, will likely be required to adapt the plan to a particular incident.

3.4.2 ICS / Unified Command (UC)

Under the Unified Command concept, the decision-making process is shared at the command level, and joint agency/Wickland participation may occur at Section levels or lower, as dictated by the nature and severity of the incident. It should be noted that while the decision process is shared, the Federal on Scene Commander (FOSC) can over-ride the decisions of the other UC members and can break tie votes. A distinct advantage of the UC approach lies in the real-time decision-making process.

3.4.3 Modular Structure

The ICS structure is intended to facilitate sizing the response resources upward or downward to meet the needs of each situation. As the size and complexity of the response increases, additional divisions, groups, and units can be added as necessary to provide the required support. Typically, additional resources are added from the bottom upward, with an existing group or unit filling a higher level in the organization and the new resources filling the new need. Similarly, groups and units may be demobilized when no longer needed, with any residual duties assumed by the next highest level in the organization.

3.4.5 Common Terminology

3.4.5.1 ICS Organization

For ease of reference and understanding, Wickland SMT positions utilize conventional ICS nomenclature for major organizational titles and distribution of functions. Some minor adjustment has been made occasionally to fit the SMT into Wickland's staffing levels style. For small releases, a single individual may fill multiple positions, or several other functions may be unnecessary.

3.4.5.2 Geographic References

It is important that standardized references be used to describe locations along the pipeline or truck route, or other locations that may be subject to exposure or response operations. There are a variety of methods used by various entities to notate location. In all cases, pipeline location references should include reference to Wickland pipeline markers for the SMF or SJC pipelines. These markers are color-coded and include Wickland's emergency telephone number. Care should be taken to distinguish Wickland markers form any others in a section of shared ROW.

A second method of approximate position description is typically used by emergency services and consists to grid references to the local Thomas Guide maps. Thomas Guide grid references are noted in the spill response maps included in this Spill Response Plan, and copies of the Thomas Guide Maps are maintained at the Control Center, with Wickland's primary response organizations, and in the cab of each response truck.

A third method of position reference is by GPS location, and is subject to the availability of portable GPS units. With GPS equipment, specific latitude and longitude or UTM coordinates can be determined for any point, and radioed or electronically transmitted to the Command Center for plotting. Certain handheld GPS units can also be utilized to navigate surface roads to the designated points. GPS coordinates may be utilized for some technical surveys, including SCAT and environmental sample collection.

3.4.5.3 Field Operations Guide (FOG)

The ICS procedure has developed a series of standardized definitions and forms. These definitions and forms should be utilized to the degree that they are applicable. Terminology commonly utilized by agencies in reference to ICS are summarized in the Field Operations Guide or FOG [ICS 420-1(Oil)]. FOG was developed by the Standardized Oil Spill Response Management System (STORMS) Task Force and was utilized in the development of Wickland SMT position descriptions. Copies of FOG are available at the Command Center. FOG can also be obtained on-line at:

http://www.losco.state.la.us/pdf_docs/USCG_Field_Operations_Guide_2000.pdf

3.4.5.4 Glossary of ICS Terms

The following glossary presents common ICS terminology:

Agency Representative Individual who has been assigned to an incident from an assisting or cooperating agency that has been delegated full authority to make decisions on all matters affecting their agency's participation in the incident.

Allocated Resources Resources dispatched to an incident.

Alternative Response Technologies (ART) Response methods or techniques other than mechanical containment or recovery. ART may include use of chemical agents, in0situ burning, bioremediation, or other alternatives. Application of ART must be authorized and directed by the OSC.

Assigned Resources Tasks given to resources checked-in and assigned to work tasks on an incident.

Assignments Tasks given to resources to perform within a given operational period, based upon tactical objectives in the Incident Action Plan.

Assisting Agency An agency directly contributing tactical or service resources to another agency.

Base That location at which the primary logistics functions are coordinated and administrated. (Incident name or other designator may be added to the term base) The Incident Command Post or Center may be co-located with the Base. There is only one Base per incident.

Cache A pre-determined complement of tools, equipment, and/or supplies stored in a designated location and available for use.

Camp A geographic site within the general incident area, separate from the Base, equipped and staffed to provide sleeping areas, food, water, and sanitary services to incident personnel.

Check-in The processes whereby resources report to an incident.

Clear Text The use of plain English in radio communications transmissions. No ten codes or agency specific codes are used when using clear text.

Command The act of directing, ordering, and/or controlling resources by virtue of explicit legal, agency, or delegated authority. May also refer to the Incident/Unified Command.

Communications Unit A vehicle (trailer or mobile van) used to provide the major part of an incident Communications Center.

Cooperating Agency An Agency supplying assistance other than direct tactical or support functions or resources to the incident control effort (e.g. Red Cross, Telephone Company, etc.)

Deputy A fully qualified person who, in the absence of a superior, could be delegated the authority to manage a functional operation or task. In some cases, a Deputy could act as relief for a superior and must, therefore, be fully qualified in that position.

Dispatch The implementation of a command decision to move resources from one place to another.

Dispatch Center A facility from which resources are dispatched directly to an incident.

Emergency Medical Technician (EMT) A heath care specialist with particular skills and knowledge in pre-hospital emergency medicine.

Emergency Operations Center (EOC) A pre-designated facility established by an agency or jurisdiction to coordinate the overall agency or jurisdictional response and support to an emergency.

Field Operations Guide (FOG) A pocket-sized manual of instructions on the application of the Incident Command System.

Function In ICS, function refers to the five major activities in ICS, i.e., Command, Operations, Planning, Logistics, and Finance. The term is also used when describing the activity involved, e.g. "the planning function".

Geographic Information System An electronic information management system that provides a geo-referenced data base to support management decision-making.

Health and Safety Plan (HASP) site specific document required by State and Federal OSHA regulations and specified in the Area Contingency Plan. The HASP shall, at a minimum, address or contain the following elements: health and safety hazards analysis for each site task or operation; comprehensive operations work plan; personnel training requirements; PPE selection criteria; site specific medical monitoring requirements; air monitoring plan; site control measures; confined space entry procedures (if needed); pre-entry briefings (tailgate meetings, initial and as needed); pre-operations commencement health and safety conference for all incident participants and quality assurance of HASP effectiveness.

Helibase A location in the general incident area for parking, fueling, maintenance and loading of helicopters.

Helispot A location where a helicopter can take off and land. May be used for loading.

Incident Action Plan (IAP) The Incident Action Plan, which is formally prepared at the first meeting, contains general control actions reflecting the overall incident strategy and specific action plans for the next operational period. When complete, the Incident Action Plan will have a number of attachments.

Incident Area Legal geographical area of the incident to include affected area and traffic route to corresponding storage and disposal sites.

Incident Command Post (ICP) That location at which the primary command functions are executed and usually co-located with incident base. A.k.a. Incident Command Center.

Incident Command System (ICS) A standardized on-scene emergency command concept specifically designed to allow its users to adopt an integrated

organizational structure equal to the complexity and demands of a single or multiple incidents, without being hindered by jurisdictional boundaries.

Incident Communications Center The location of the communications unit and the message center.

Incident Situation Display The situation Unit is responsible for maintaining a display of situation status boards that communicate critical incident information vital to establishing an effective command and control environment.

Initial Action The actions taken by resources that are the first to arrive on scene.

Initial Response Resources initially committed to an incident.

Joint Information Center (JIC) A facility established within or near the Incident Command Post where the information officer and staff can coordinate and provide information on the incident to the public, media and other agencies. The JIC is normally staffed with representation from the OSC, State IC, and Wickland.

Jurisdiction The range or sphere of authority. Public agencies have jurisdiction at an incident related to their legal responsibilities and authority for incident mitigation. Jurisdictional authority at an incident can be political/geographical (e.g., city, county, state, or federal boundary lines), or functional (e.g., police department, health department, etc.).

Message Center The message center is part of the communications center and co-located with it. It receives records, and routes information about resources reporting to the incident, resource status, and administrative and tactical traffic.

Multi-Agency Coordination System (MACS) The combination of facilities, equipment, personnel, procedures, and communications integrated into a common system with responsibility for coordination and assisting agency resources and support to agency emergency operations.

Multi-Agency Incident An incident where one or more agencies assist a jurisdictional agency or agencies. May be single or unified command.

NOAA Weather Station A mobile weather data collection and forecasting facility (including personnel) provided by the National Oceanic and Atmospheric Administration that can be utilized within the incident area.

Natural Resource Damage Assessment (NRDA) The process of identifying and quantifying the resource impacts and evaluating the value of impacted resources for the purposes of restoration.

On Scene Coordinator (OSC) The pre-designated federal On Scene Coordinator operating under the authority of the National Contingency Plan (NCP).

Operational Period The period of time scheduled for execution of a given set of operational actions as specified in the Incident Action Plan Operational periods can be given various lengths, usually not more that 24 hours.

Out of Service Resources Resources assigned to an incident but unable to respond for mechanical or personnel reasons.

Planning Meeting A meeting, held as needed throughout the duration of the incident, to select specific strategies and tactical measures for incident control operations and for service and support planning.

POLREP Pollution Report.

Qualified Individual The person authorized by the responsible party to act on their behalf, authorize expenditures, and obligate the organization's resources.

Radio Cache A cache may consist of a number of portable radios, a base station, and in some cases, a repeater stored in a pre-determined location for dispatch to incidents.

Recorders Individuals within ICS organizational units who are responsible for recording information.

Regional Response Team (RRT) The federal response organization, consisting of representatives from selected federal and state agencies, which acts as a regional body responsible for regional planning and preparedness before an oil spill occurs, and for providing advice to the OSC in the event of a major or substantial spill.

Reporting Location Any one of the facility locations where incident assigned resources may check in. The locations are: Incident Command Post (Center)-resources Unit; Base; Camp; staging Area; Helibase; or division supervisor for direct line assignments (Check in at one location only).

Resources All personnel and major items of equipment available.

RP Responsible Party.

Single Resource An individual, piece of equipment and its personnel complement, or a group or team of individuals with an identified work supervisor that can be used on an incident.

Site Safety Plan Legal documentation required by OSHA before entry into a site, prepared by the Safety Officer.

Span of Control The supervisory ratio of three to seven individuals, with one to five being established as optimum.

Staging Area That location where incident personnel and equipment are assigned awaiting tactical assignment.

State I.C. State Incident Commander

Strategy The general plan or direction selected to accomplish the incident objective.

Supporting Materials Refers to the several attachments that may be included with an Incident Action Plan (e.g., communication plan, map, safety plan, traffic ***plan, and medical plan).***

Tactical Direction Direction given by the Operations Section Chief, which includes the tactics appropriate for the selected strategy, the selection and assignment of resources, tactics implementation, and performance monitoring for each operational period.

Task Force A group of resources with common communications and leader, assembled for a specific mission.

Technical Specialists Personnel with specialized skills that can be used anywhere within the ICS organization.

Temporary Flight Restrictions (TFR) Temporary airspace restrictions for non-emergency aircraft in the incident area. TFRs are established by the FAA to ensure aircraft safety and are normally limited to a five nautical mile radius and 2000 foot ceiling.

Unified Command (UC) In ICS, Unified Command is a unified team effort that allows all agencies with responsibility for the incident, either geographical or functional, to manage an incident by establishing a common set of incident objectives and strategies. This is accomplished without losing or abdicating agency authority, responsibility, or accountability.

Volunteer Any individual accepted to perform services by the lead agency that has the authority to accept volunteer services. A volunteer is subject to the provisions of the authorizing statue.

3.4.5.5 Planning Sequence and Incident Action Plans

The Incident Command System utilizes a standardized sequence of activities, or planning cycle. A typical planning cycle is shown in Figure 3.2.

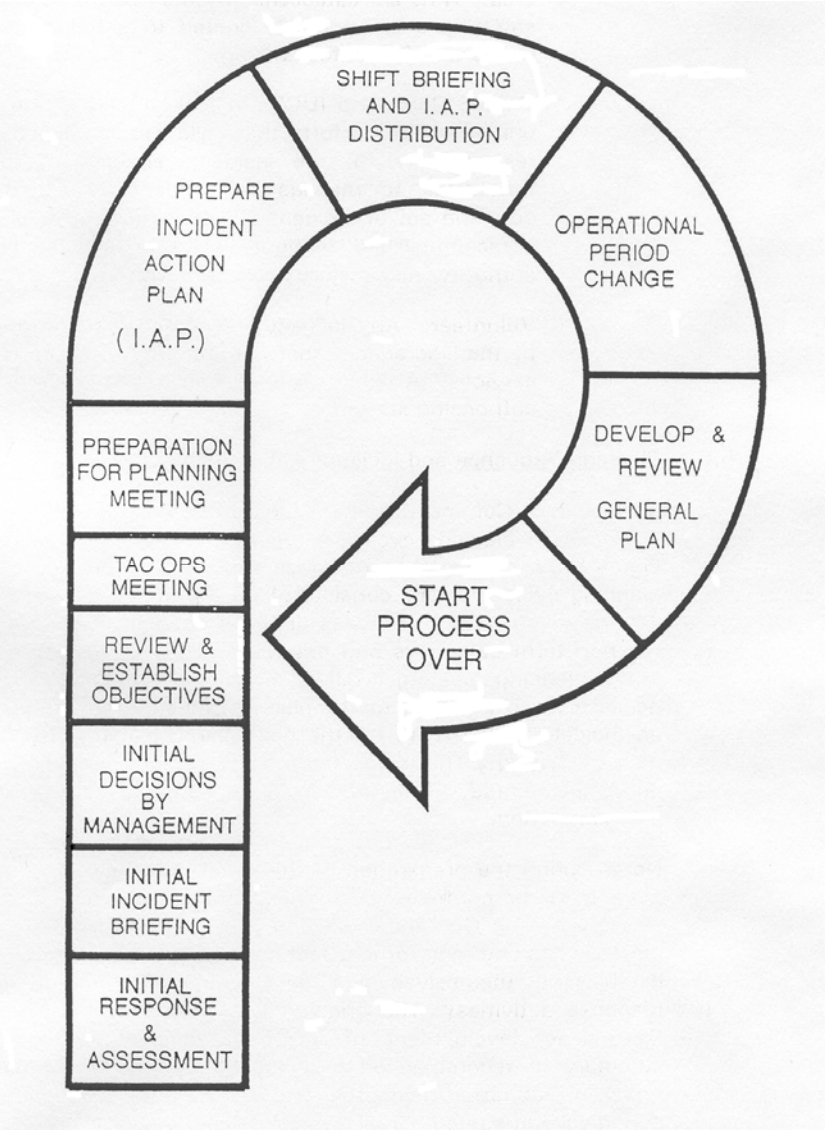


Figure 3.2 Typical ICS Planning Cycle

Once initial response actions have been initiated, the planning cycle typically consists of current situation review, actions taken and the success of those actions, then based on review analysis the establishment of short-term objectives and priorities. This is typically done in a status/planning meeting attended by Section Chiefs and others as necessary. The results of the planning meeting are summarized in an Incident Action Plan for the next planning period (typically the next 24 hours). The IAP is then reviewed and approved by the IC and implemented. The process is repeated for each successive planning period.

Note: During the preparation of the initial IAP, emergency response actions will be controlled by the ISRT, local emergency services, and perhaps by the Operations Section of the spill management team. During this initial period, Planning and other Sections of the organization will be establishing themselves and developing plans for longer term response activities. The primary initial objective for the Planning Section is development of an initial IAP, or summary of recommended or planned actions. An initial IAP is typically submitted near the end of the first day and revised periodically at some interval, typically daily.

There are no absolute guidelines regarding IAP format and level of detail..It should be adjusted to provide adequate information for interval planning, but not be excessive in size or detail. Remember that the IAP is a tool, and that the overriding objective of the response is the control and cleanup of the spill, not the generation of paper. The initial IAP should be drafted by the Planning Section, with input from the other sections, and submitted to the UC in time for review and approval and mobilization of specified resources before the start of the subject-planning interval.

A typical IAP using ICS forms could include the following:

- Section 1) Incident Action Plan Cover sheet
- Section 2) Response Objectives (ICS Form 202)
- Section 3) Organization Assignment List (ICS Form 203)
- Section 4) Division Assignment List (ICS Form 204)
- Section 5) Communications Plan (ICS Form 205)
- Section 6) Medical Plan (ICS Form 206)
- Section 7) Incident Maps (Present Situation, Trajectories, Planned Actions)
- Section 8) Traffic Plan
- Section 9) Resources at Risk Summary (ICS Form OS-232)
- Section 10) Other information as needed for tactical response.
- ICS Forms

A number of ICS forms have been developed in an attempt to standardize information exchange, Incident Action Plan (IAP) preparation, and incident documentation. A complete package of ICS forms can be obtained on-line at:

http://homeport.uscg.mil/mycg/portal/ep/browse.do?channelId=-17668

The ICS forms provided follow the following hierarchy:

- Emergency Phase
  Initial Incident Information
  Incident Briefing (ICS Form 201)
  Operational Planning Meeting
  Operational Planning Worksheet (ICS Form 215)
  Radio Requirements Worksheet (ICS Form 216)
  Radio Frequency Worksheet (ICS Form 217)
- Incident Action Plan
  IAP Cover A/B
  Incident Objectives (ICS Form 202)
  Organization List/Chart (ICS Form 203/207)
  Assignment List (ICS Form 204)
  Assignment List Attachment (ICS Form 204a)
  Radio Communications Plan (ICS Form 205)
  Communications List (ICS Form 205a)
  Medical Plan (ICS Form 206)
  Resources At Risk (ICS Form 232)
- Executive Summary
  Incident Status Summary (ICS Form 209)
  Air Operations Summary (ICS Form 220)
  Meeting Schedule (ICS Form 230)
  Meeting Summary (ICS Form 231)
  General Plan
- Resource Tracking
  Status Change (ICS Form 210)

Check-in List (ICS Form 211)

Check-in List - Equipment (ICS Form 211e)

Check-in List (ICS Form 211p)

Support Vehicle Inventory (ICS Form 218)

T-Cards (ICS Forms 219-2, 219-4, 219-6, 219-7)

Demobilization Checkout (ICS Form 221)

- Miscellaneous

  General Message (ICS from 213)

  Unit Log (ICS Form 214)

  Individual Log (ICS Form 214a)

  ACP Site Index (ICS Form 232a)

Experience has shown that many of the standard ICS forms are not always necessary, some may be inappropriate for a particular incident, and some may require modification to adapt them to a particular situation. Attempts to force information into a specific ICS is neither required nor recommended. It is usually better to develop a new form that matches the needs of the situation (with IC concurrence).

It is anticipated that drill experience will lead to he customization of forms adapted to Wickland's organization, geographic conditions, and resources. Revised working forms should be added to the Command Center inventory as they are developed.

3.4.5.6 Meeting / Briefing Schedule

General

The number and frequency of ICS meetings is dependent on the size, duration, and complexity of the incident. Small response actions of limited duration can often be coordinated with ICS Form 201 - type briefings. Longer term, more complex responses typically require development of an Operational Planning Cycle, in which plans are developed for an operational period (usually 24 hours), implemented, evaluated, and revised for the next operational period. Certain meetings, briefings, and information gathering during each cycle are used to develop the Incident Action Plan for the initial and subsequent operational periods. The type and frequency of meetings should be limited to the needs of each incident response, and the meetings should be short and focused. Remember that your objective is to manage the emergency, not hold meetings. The following meeting guidance has been adapted from the ICS-OS-420-1 Field Operations Guide. Fewer or more meetings may be necessary to accommodate the needs of a particular incident.

Incident Briefings

Incident Briefings based on ICS Form 201 should occur at the time of transfer of response command. These briefings provide the incoming command staff with basic information on the incident situation and resources allocated, incident briefings are also suitable for briefing other newly assigned SMT personnel.

When: Arrival of new Incident Commander; staff briefings as required.

Briefer: Current Incident Commander or person leaving position or responsible for activity.

Attendees: Incoming Incident Commander and staff, as required.

Agenda: ICS From 201

Tactical Operations (TACOPS) Meeting

This meeting develops the concept for tactical deployment during the next operational period. In preparation for this meeting, the IC, Planning Section Chief, and Operations Section Chief should review the current IAP and/or situation, and compare progress versus objectives. Primary and alternative strategies are then developed for consideration at the next Planning Meeting. This meeting should be limited to no more than 30 minutes.

When: Prior to Planning Meeting

Facilitator: Planning Section Chief

Attendees: Incident Commander, Operations Section Chief, and Logistics Section Chief.

Agenda:

Develop objectives for next operational period

Identify primary and alternative strategies

Prepare draft ICS Form 215 to identify resources that should be ordered through logistics

Planning Meeting

Incident objectives, strategies, tactics, and resources for the next operational period are developed in the Planning Meeting. The meeting should last no longer than 45 minutes. Meeting preparations should include a Tactical Operations meeting, development of a preliminary ICS Form 215, a current resource inventory, and a current situation display. Results of the meeting are used by Logistics to prepare tactical and logistical resource orders, and by the Planning Section Chief to develop IAP assignment lists.

When: After Initial Briefing and TACOPS meetings.

Facilitator: Planning Section Chief

Attendees: Variable - May include Command staff and general staff, as required.

Agenda:

Incident objectives - policy issues (IC or Command staff)

Briefing of situation, critical/sensitive areas. Weather forecast, resource status.(Planning Section Chief)

State primary and alternative strategies to meet objective (Operations Section Chief).

Designate operational boundaries (use maps and ICS Form 215) (Operations Section Chief)

Specific tactics and resources for each operational unit, including limitations (Operations Section Chief)

Develop resources, support, and equipment (Planning Section Chief)

Consider support, including communications, traffic, safety, medical, etc. (Planning Section Chief)

Safety Considerations (Safety Officer)

Set deadline for submission of Incident Action Plan (Planning Section Chief)

Operations Briefing

The less than 30 minute meeting is intended to brief the oncoming shift regarding the IAP for the next operational period.

When: About 1 hour prior to each shift.

Facilitator: Planning Section Chief

Attendees: Command staff, general staff, Unit Leaders and others, as appropriate.

Agenda:

Review objectives and changes to IAP (Planning Section Chief)

Current response actions and last shift accomplishments (Operations Section Chief)

Weather Forecast (Environmental Unit Leader)

Assignments (Operations Section Chief)

Trajectory Analysis (Environmental Unit Leader)

Transport, Communications, Supply update (Logistics Section Chief)

Safety Message (Safety Officer)

Financial Report (Finance Section Chief)

Media Report (Legal Officer)

IAP approval and motivational remarks (Incident Commander)

Unified Command Meeting

Provides officials with an opportunity to discuss and concur on important issues prior to joint incident action planning. The meeting should be brief and all points documented. Prior to the meeting, parties should have the opportunity to review data and prepare to address agenda issues. Results can be used as input for decisions regarding unified operations.

When: When a UC is formed, and later as needed.

Facilitator: UC Member

Attendees: Only Incident Commanders that will comprise the Unified Command.

Command Staff Meeting

Coordinate Command Staff functions, responsibilities and objectives. It is normally held before the Tactical Operations Meeting, and is usually a closed meeting.

Incident Situation Display

Information critical to the functions of various Units and other activities should be posted in an accessible location in the Command Center. Types of information may include (but are not limited to):

Response Objectives (ICS 202)

Resources at Risk Summary (ICS 232)

Assignment List (ICS 203)

Resources Status (ICS 201)

Weather / Tides

Maps

- Spill Movements and extent of contamination
- Response Zones
- Sensitive Areas and Cleanup Priorities
- Operations in Progress

Meeting Schedule

Displays need not be overly elaborate, but should be comprehensive and up-to-date. They should also be large enough to be readable by multiple observers. If electronic displays are utilized, monitors should be large enough to be viewed by multiple parties, or multiple monitors setup. Displays are normally established and maintained by the Situation and Resource Units with input from the Environmental Unit and others, as appropriate.

4.0 OPERATIONS SAFETY

4.1 General Requirements

Health and Safety requirements for most oil spill response activities are defined in regulations including:

- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.119: and
- Occupational Safety and Health Administration (OSHA) 29 CFR Part 1910.120 (HAZWOPER Regulation)

These regulations define petroleum products as hazardous substances, and the area impacted by an oil spill is generally considered as an uncontrolled hazardous waste site. Most spills will fall into the scope of the regulations regarding Hazardous Waste Operations and Emergency Response (HAZWOPER). These regulations require pre-event training for personnel who may be involved in emergency response activities so that an actual emergency response may be safe, timely and effective. Specific pre-event items that can be done include development of an emergency response plan and general worker health and safety training. In addition, and incident-specific safety plan (Site safety plan) must be prepared for each response and updated as necessary. In addition to its own employees, Wickland is responsible for ensuring that its operator, contractors, and those under their immediate control demonstrate the required training and adhere to the incident site safety plan.

This section contains the following guidance:

- A summary of general worker health and safety hazards;
- A summary of general worker health and safety training requirements;
- Instructions for preparation of an Incident Health and Safety Plan;
- Instructions for conducting health and safety briefings and updates; and
- Guidelines for Public Information and Safety Alerts

Worker Health and Safety is a vital issue and must be planned for, implemented, and monitored on an incident-specific basis. Assistance can be obtained from federal and state representatives through the Incident Command. Training requirements are described in greater detail in Section 8.0 of this OSCP.

4.2 Health and Safety Hazards

4.2.1 General

Detailed health and safety information is provided in the Material Safety Data Sheet (MSDS) for jet fuel. A copy of this MSDS is provided in Appendix C.

4.2.2 Fire and Explosion Hazard

ALL SPILLS SHOULD BE CONSIDERED AS POTENTIAL FIRE AND EXPLOSION HAZARDS, PARTICULARLY IN THE IMMEDIATE VICINITY OF THE RELEASE POINT.

Jet fuel (Aviation Turbine Fuel) is listed by OSHA as a combustible liquid. It should be considered as a potential fire hazard, which may generate explosive vapors under certain conditions. Invisible vapor generated by evaporation spreads easily and can be ignited by many sources, such as pilot lights, welding equipment, electrical motors and switches, and possibly vehicles. Particular caution should be given to enclosed storm drains, basements, creek beds and other confined or semi-confined spaces adjacent to and down gradient from the release point where vapors can concentrate. In addition, materials transported by pipeline are under pressure. Small leaks may form mists or aerosols during decompression which can be flammable or explosive, and which can be blown by the wind. Fire and explosion hazards associated with jet fuel spills are generally localized, and decrease rapidly as the spill evaporates. Some specific characteristics of jet fuel include:

- Flash Point: (Tagliabue Closed Cup ASTM D56) 38°C (100°F) (Min)
- Auto ignition: 210°C (410°F)
- Flammability (Explosive) Limits (% by volume in air): Lower: 0.7 Upper: 5

4.2.3 Human Health Hazard

Jet fuel transported by the SMF and SJC pipelines contains volatile hydrocarbons including ethyl benzene, which are known to present health hazards to humans. Concentrations of these compounds should not reach dangerous levels during normal spill situations, particularly after the initial 12 to 24 hours, unusual conditions can be encountered and monitoring for hydrocarbon concentrations may be appropriate during the initial period. If necessary, respiratory protection may required, or supplied air may be necessary for confined space entry or exposure to aerosols. Need for, the extent and duration of any additional monitoring can be determined based on observations at the time of the incident.

Direct contact with jet fuel may cause minor skin irritation. Prolonged or repeated contact may be harmful. Ingestion or inhalation may also be harmful. Prolonged or repeated exposure may cause cancer (Ethyl benzene and naphthalene have been classified as Group 2B carcinogens *possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

4.2.4 Adjacent Operations

Other pipelines adjacent to the Wickland right of ways transport natural gas. Locations of these pipelines are generally indicated with surface markers. Caution should be exercised in all cases to prevent damage to other operators. Assets in cases where multiple pipelines share the ROW, approach the leak site from upwind with caution, and determine whether adjacent facilities have incurred damage as well.

A variety of utility lines cross the ROWs and can present hazards to response operations and workers, particularly if cranes or similar equipment are used. All areas

of intended operation must be screened for overhead and buried power lines. Such lines must be avoided or shut off as determined necessary by the Safety officer.

4.2.5 Weather

Heat exhaustion may present a responder major Health and Safety issues during a response. Adequate fluids, rest periods and shade must be provided, and are an essential part of the Site Safety Plan.

4.3 Site Safety Plan

4.3.1 General

Regulations require that an Incident site safety plan be prepared and implemented prior to commencement of emergency operations. The first emergency management team on scene must therefore develop and implement this plan.

4.3.2 Incident Site Safety Plan (ISSP)

To expedite the preparation of an Incident Site Safety Plan, Wickland has adopted a generic site safety plan that can be used as a framework for the development of the Incident Site Safety Plan. Figure 4.1 presents a copy of an Incident Site Safety Plan with instructions for completion of its various provisions.

SMF AND SJC PIPELINE SYSTEMS WICKLAND PIPELINES LLC OIL SPILL RESPONSE OPERATIONS INCIDENT SITE SAFETY PLAN
(date)
A. INCIDENT NAME
Location or nearby feature commonly used to identify.
B. GENERAL LOCATION
Describe release milepost and/or location, Use map if necessary. Include GPS or other map coordinates.
C. SITE CHARACTERIZATION AND ANALYSIS

SMF AND SJC PIPELINE SYSTEMS
WICKLAND PIPELINES LLC

OIL SPILL RESPONSE OPERATIONS
INCIDENT SITE SAFETY PLAN

(date)

Include:

- Location
- Description of site and topography
- Materials released
- Description of operations
- Expected duration of cleanup
- Safety and health hazards expected
- Material Data Safety Sheets
- Pathways for hazardous substance dispersion
- Personal protective equipment required
- Initial monitoring performed
- Special work practices
- Engineering controls
- Drum handling required
- Potential for additional emergency release

D. ORGANIZATIONAL STRUCTURE

Include:

- On-Scene Commander
- FOSC
- SOSC
- Local Emergency Services Coordinator
- Site Safety Officer
- Contractor Project Manager(s)

E. WORKPLAN

Include a brief description of cleanup activities, tasks, approximate work force and any special equipment required.

F. SAFETY AND HEALTH HAZARDS

SMF AND SJC PIPELINE SYSTEMS
WICKLAND PIPELINES LLC

OIL SPILL RESPONSE OPERATIONS
INCIDENT SITE SAFETY PLAN

(date)

Describe safety and health hazards that may be associated with the cleanup operation. Potential hazards may include: skin contact with oil; water hazards including high flow and boating hazards; heat stress; hypothermia; hazards to the eye; heat exhaustion; cuts and abrasions; heavy object lifting; poisonous animals; vehicular / pedestrian traffic; infectious conditions; high crime areas; and other hazardous conditions known to potentially exist. MSDS for the spilled material should be reviewed and attached.

G. TRAINING PROGRAM

Describe procedures for specialized training or emergency HAZWOPER training and/or qualification.

H. PRE-ENTRY (DAILY) BRIEFING

Daily and special briefings are required to ensure that all personnel are adequately advised of safety hazards and issues. These briefings should be conducted each morning to convey new information and/or inform new personnel. Include schedule here.

I. EFFECTIVENESS OF SITE SAFETY PLAN

Describe a program to conduct periodic safety inspections / observations, document results and correct safety plan, if necessary.

SMF AND SJC PIPELINE SYSTEMS
WICKLAND PIPELINES LLC

OIL SPILL RESPONSE OPERATIONS
INCIDENT SITE SAFETY PLAN

(date)

J. SITE CONTROL - OFFSITE OPERATIONS

The cleanup site will be shown on a sketch attached to the Incident Site Safety Plan. If necessary, the site itself should be marked as appropriate. Control and decontamination zones should be established as necessary. Access to the site should be controlled. No cleanup personnel should be allowed to work alone within the controlled area. Workers will be alerted to emergencies by radio, loudspeaker or other approved means of communication. Medical assistance should be provided on site (aid station) and the closest medical facility identified. Contractors will be required to comply, at a minimum, with all safety and health requirements.

K. WORK PRACTICES

Special work practice instructions, if any, should be described here.

L. PERSONAL PROTECTIVE EQUIPMENT

PPE requirements should be described here. The description should include consideration of hardhats, safety shoes, goggles, gloves, protective suits, rain gear, life jackets, etc.

M. MEDICAL SURVEILLANCE

Baseline physical examinations may be required for workers in contaminated areas. Monitoring requirements should be summarized here.

N. MONITORING PROGRAM

Workers

Employees and contractors working in contaminated areas are required to complete HAZWOPER and first aid training. A monitoring program should be established to

SMF AND SJC PIPELINE SYSTEMS **WICKLAND PIPELINES LLC** **OIL SPILL RESPONSE OPERATIONS** **INCIDENT SITE SAFETY PLAN**
(date)
verify worker compliance with this requirement. Site visitors may be required to demonstrate the same training requirements before entering controlled areas. Documentation of all site visitors (check in and checkout) should be maintained.
Environmental Conditions
Monitoring of airborne hydrocarbon constituents may be required. Constituents of concern may include, but not be limited to, benzene, hydrogen sulfide, LEL/UEL, and oxygen content.
Basic daily weather and sea state data should also be recorded.
O. DECONTAMINATION
Decontamination of workers and equipment will be required in most cases. Include a description of decontamination facilities and procedures.
P. EMERGENCY RESPONSE
Plans should be developed for managing emergencies with may occur during the cleanup operation. These plans may include development of evacuation procedures and should include identification and phone numbers for hospitals, ambulances, paramedics, etc. In some cases, on site resources may be appropriate.
Q. CONFINED SPACE ENTRY
Confined entry space should be conducted only by specifically trained personnel. If entry is necessary, it is essential to test the confined spaced for oxygen and toxic and combustible gases. Test procedures and entry criteria should be listed here.

Figure 4.1. Incident Site Safety Plan and Instructions

4.4 PUBLIC INFORMATION AND SAFETY ALERTS

The general public may be exposed to hazards related to the presence of oil during a spill. Spilled materials can present fire/explosion and other safety hazards. Particular concern should be given to areas of human concentration and potential access, both along the pipeline ROWs and in immediately adjacent areas or along major drainages. Rapid assessment and close coordination with local emergency services is essential in the identification of areas at risk and implementation of spark source control and, if necessary, evacuation.

The Public may also be exposed to hazards from spill response operations. Spill response operations, particularly on land, can involve use of heavy equipment and increases in traffic that may present public safety hazards. Traffic control and establishment of restricted access areas may be required and coordinated with local emergency services.

As the response effort proceeds, it may be necessary to provide the public with safety information, including instructions regarding traffic control. This information can be in the form of general public announcements, meetings, presentations, or response to individual issues or inquiries. The Safety Officer should coordinate all information with local emergency service, health and public works officials, as appropriate. The Incident Command must approve all public information announcements.

5.0 RESPONSE PROCEDURES

5.1 Introduction

This section provides stepwise guidance for initial spill response actions. Information contained herein is intended to provide a framework for initiating and maintaining response actions for the first several days of the response. Requirements for any spill response will be determined by incident-specific conditions, and the guidance presented herein may require case-by-case modification.

5.2 Response Action Sequence

While each spill incident may be different, there is a general sequence of activities involved in an oil spill response. This general sequence is summarized in Figure 5.1. This figure may be used to guide the major steps in the response process, with the understanding that case-specific conditions may alter the sequence and nature of some steps.

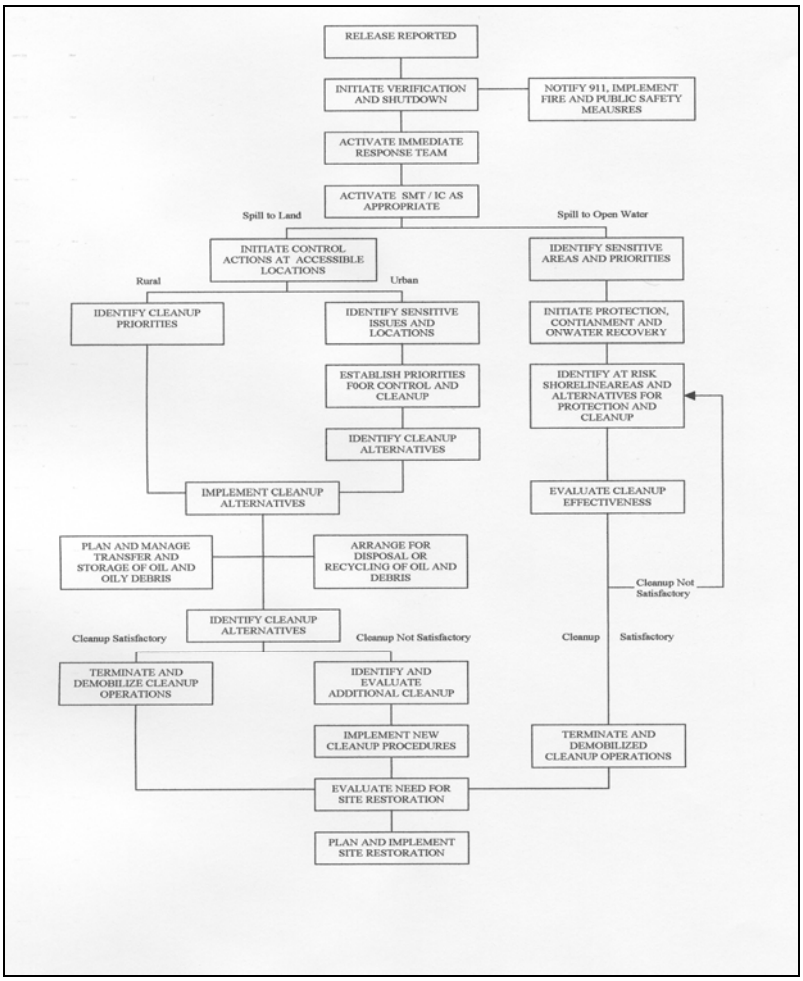


Figure 5.1 Response Action Sequence

5.3 Shutdown Actions

On receipt of a system alarm (instrumentation or open circuit) or report of a spill, the pipeline operator will conduct spill conformation, shutdown the operation, as appropriate (including closing all valves to isolate line segments), and initiate emergency notifications.

5.4 Site Safety

5.4.1 Initial Responders

All Wickland and response organization personnel shall have safety training exceeding requirements of 29 CFR Part 1910.120. All Wickland personnel involved in spill response will be familiar with the content and use of this OSCP.

5.4.2 Public Safety

Initial responders will warn residents and businesses of potential danger associated with the incident and advise/assist in their evacuation to a safe area. However, Wickland personnel have no authority to order evacuation. Local emergency services can be contacted to assist in evacuation of persons reluctant to do so.

5.4.3 Site Safety and Health Plan

A Site Safety and Health Plan addressing incident-specific conditions must be completed and submitted to the IC for approval. It is recognized that some initial response actions may be implemented prior to the completion and approval of this plan. Individuals having appropriate training in spill response health and safety issues typically conduct these activities.

Information useful in development of the Site Safety and Health Plan is provided in Section 4.3.2 and the product MSDS (Appendix B). Additional assistance may be obtained from federal and state representatives on the IC/UC.

5.4.4 Safety Briefings

A safety briefing shall be conducted for all response personnel and observers prior to their entering a contaminated area. This briefing must include a description of hazards associated with the material released or materials utilized in the response, requirements regarding use of Personal Protective Equipment (PPE), and a description of any potential environmental or other hazards. Additional safety briefings and updates shall be given to any new response personnel before they enter a contaminated area, and to response crews and others working within the contaminated zone on a regular (usually daily) basis. In particular, these briefings should include identification of safety issues identified during the response and actions taken to prevent re-occurrence.

5.4.5 Hot Zones

Area of contamination requiring the use of PPE or having special health and safety requirements should be isolated and designated “Hot Zones”. Access to Hot Zones should be controlled and limited to those with appropriate training and

equipment. Entrances to Hot Zones shall be equipped with PPE dress-out stations and decontamination stations.

5.4.6 Safety Briefing Documentation

All persons receiving health and safety briefings are required to sign a participation list documenting their participation. Safety and Health documentation also include recording of HAZWOPER certification, First Aid training and issuance of PPE, as appropriate.

5.4.7 Equipment DECON Documentation

For larger responses or any responses involving multiple equipment suppliers, it is desirable to develop procedures for tracking the ownership and condition of all major equipment going through DECON. This information can be vital in accounting for equipment, equipment use and equipment damage after a response.

(b) (7)(F)

[redacted]

5.6 Selection of Spill Response Procedures

5.6.1 Overview

All spills involve different and continually changing conditions. This section contains guidance to assist in selection of response procedures for unanticipated or changing circumstances. Included in this section is guidance for the assessment of a release and the selection of appropriate response procedures. The section includes a series of decision guides that have been developed to assist in the initial and periodic review of conditions and response alternatives.

5.6.2 Assessment

5.6.2.1 Estimation of Volume

A preliminary estimate of the size of a pipeline release can be made from the pipeline instrumentation, from calculating pumping loss from the time of the incident until shutdown, from estimates of static pipeline drainage, and from visual estimates. The following section discusses estimate procedures.

Instrumental Calculation

Wickland's computerized control system monitors pumping rates and receipts, and can provide rapid initial estimates of volumes released during pumping. This system will not provide estimates of static drainage after shutdown.

Loss Due To Pumping

Loss due to pumping can also be calculated manually by multiplying the loss rate by the time elapsed from event discovery to shutdown. A maximum pumping loss can be calculated by using the estimate-pumping rate (For SMF Pipeline, specific data available from the KMEP pipeline controller; average pump rate 4,750 to 5,580 bbl/hr in full flow mode. For SJC Pipeline (b) (7)(F) [redacted].). For a non-catastrophic spill event, estimation of pumping loss may be very difficult. For purposes of initial response, an accurate estimate is not necessary. A working number using estimated pumping rate is adequate. Remember to carefully qualify this number as a rough estimate, as it is likely that it will be remembered.

Loss Due To Drainage

After pumping has been terminated, sections of pipeline topographically above a point of failure to the adjacent high point will attempt to drain. Adjacent sections of the pipeline may be above or below the leak point and drainage may occur from one or both directions, depending on location. In addition, pipeline valves will influence pipeline drainage. On the SMF Pipeline, valves have been placed at the Sacramento River crossing to control the magnitude of potential spills to that water body.

To estimate maximum potential pipeline drainage, it can be assumed that the contents of a pipeline uphill from a break will drain from the break point to the

next adjacent topographic high point or valve. Oil in low spots between the break point and the high point can be subtracted for estimating purposes.

The drainage volume can then be calculated by multiplying the length of pipe subject to drainage by its cross sectional volume. For estimating purposes, the SMF Pipeline is assumed to have an inside diameter of 11.44 inches, or an approximate volume of 0.127 barrels of jet fuel per foot of pipeline. The SJC Pipeline is assumed to have an inside diameter of 7.36 inches, or an approximate volume of 0.053 barrels of jet fuel per foot of pipeline.

Visual Estimates

Accurate visual estimates are difficult to achieve because spilled oil is seldom uniformly distributed. The basic procedure involves estimation or measurement of the spill surface area, multiplied by its estimated average thickness of the oil.

- **On land**, area may estimated from air photos or maps. Estimated of thickness can be made at a number of locations and an average thickness calculated and applied to he estimated area of coverage.
- **On water**, spreading effects tend to make the oil thickness somewhat more uniform. The thickness of oil on water can then be estimated from its color. Figure 5.2 relates oil color and appearance to thickness and quantity.

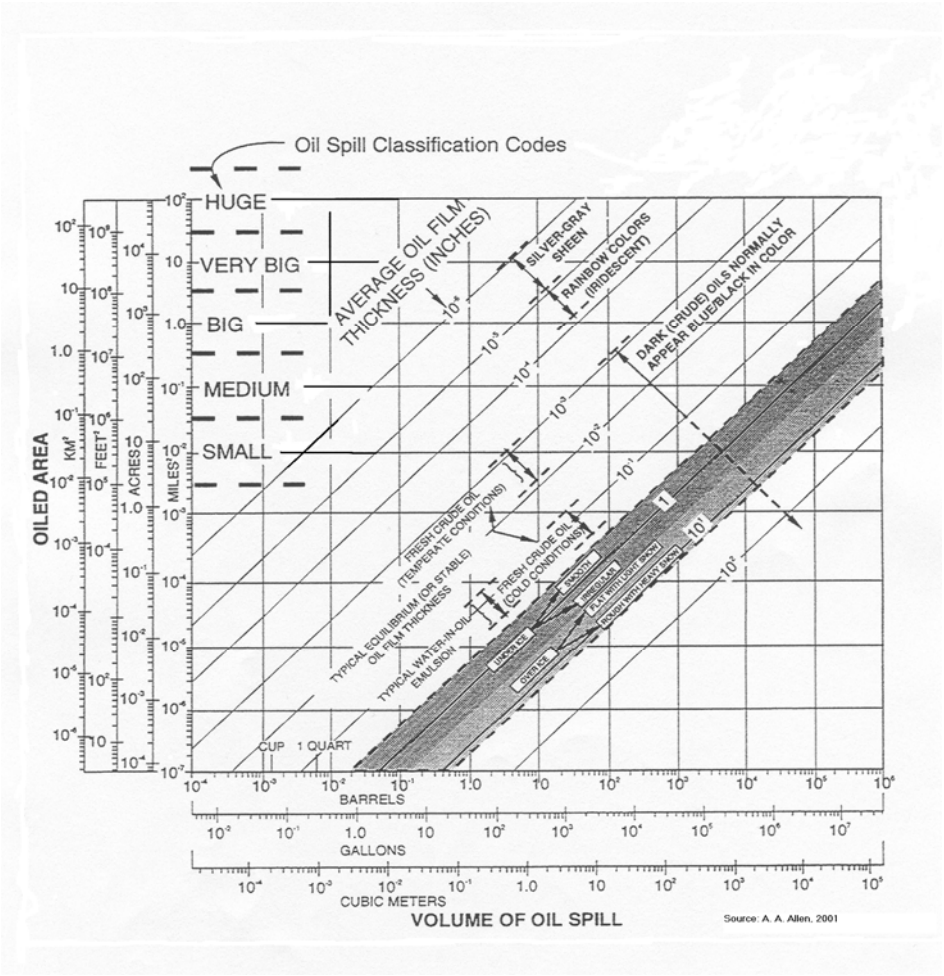


Figure 5.2 Oil Appearance And Coverage Chart

5.6.2.2 Spill Movement Assessment and Prediction

Spills to Land

Releases associated with the SMF Pipeline or SJC Pipeline will be controlled primarily by gravity, temperature and the presence of water. The product transported by the system is Aviation Turbine Fuel. Aviation Turbine Fuel has several properties that influence its behavior when spilled. On land, spilled fuel will flow down gradient on the land surface. On paved areas it will flow down gradient and enter any storm drainage systems present. On agricultural land, it will enter irrigation ditches and canals.

Aviation Turbine Fuel is mobile and can penetrate into sediments, potentially threatening groundwater resources if not immediately contained and controlled. It is a distillate fuel, containing toxic water soluble hydrocarbon fractions.

The degree of threat to groundwater presented by a fuel spill is subject to variables including the size and location of the release, permeability of the soil impacted, depth to groundwater, and effectiveness of any response action.

Petroleum hydrocarbons will adsorb onto soil particles and be held in soil pore spaces by capillary action. Left uncontrolled, a fuel spill will penetrate into a porous soil until it is absorbed and bound by soil particles or until it reaches an impermeable layer or groundwater. Soils typically can retain 15 to 40 liters of petroleum per cubic meter or approximately 3 to 8 gallons per cubic yard (CONCAWE, 1983).

Irrigation Ditches, Creeks and Streams

Oil entering irrigation ditches, creeks and streams, fuel will move downstream with the current. Some spreading may occur, but even a slight current will typically overcome the spreading motion. For purposes of movement prediction, assume that the oil will move at stream flow velocity without wind or other effects. In practice, oil will tend to accumulate in areas of quiet water or eddies. These areas can frequently be identified by the presence of accumulated debris. Flow direction in agricultural lands may vary, depending on whether the fields are being irrigated, are static, or are being drained (pumped). Case-by-case assessment will be needed to accurately evaluate flow direction.

Field Measurement of Stream Flow

Flow velocity may be estimated by timing the movement of a floating object, such as an orange, over a measured distance. Current measurements provide useful information about areas of intended boom deployment.

Chezy-Manning Calculation of Stream Flow

Estimates of stream flow velocity can be calculated using the Chezy-Manning Equation, as described in 40 CFR Part 112, Appendix C (EPA OPA'90 Regulations). The Chezy – Manning equation is:

$$V = (1.5/n) * r^{(2/3)} * s^{(1/2)}$$

where:

n = roughness coefficient (For minor stream: 0.03 for straight clean channels; 0.04 for winding clean channels; 0.06 for sluggish [weedy, deep pools] with no trees or brush; and, 0.10 for sluggish streams with trees and brush).

R = hydraulic radius (approximately 0.667 * the channel depth)

S = channel slope (as taken from USGS topographic maps, elevation change divided by channel length)

V = velocity (in feet per second)

Flow vs. Velocity Graph

Stream flow velocities can also be estimated from stream flow predictions or real time data (flow data for some streams may be available in terms of flow- cubic feet per second). Figure 5.3 has been developed to assist in converting flow data to flow velocity. To use this table, it is necessary to visually estimate stream width and average depth. Superimposed on the figure are generally accepted boom performance regimes.

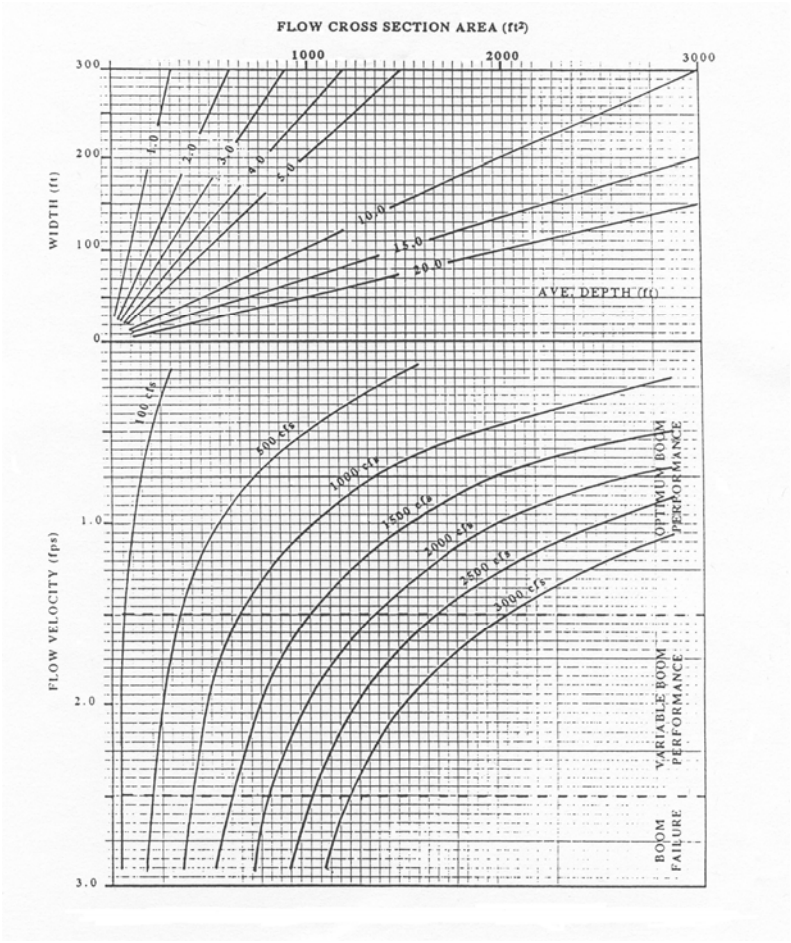


Figure 5.3 Stream Flow vs. Velocity Graph

Example: Access can be gained to a stream near a bend where the stream is approximately 50 feet wide. Observations indicate that the stream is an average of 3 feet deep at this point. An upstream gauging station has reported a stream flow of 100 cubic feet per second (cfs). As shown at the top of the figure, stream width and average width can be used to determine flow cross section area (300 square feet). This cross section area is then dropped to the lower portion of the figure until it intersects the reported flow. Reading horizontally to the left, a flow velocity of .75 feet per second (fps) can be determined. Reading horizontally to the right, it can be seen that this velocity falls within the range where booming is generally acceptable.

Boom performance at higher flow velocities can generally be improved by deploying the boom at an angle to the current. Figure 5.4 has been designed to assist in the determination of boom deployment angles at various flow velocities.

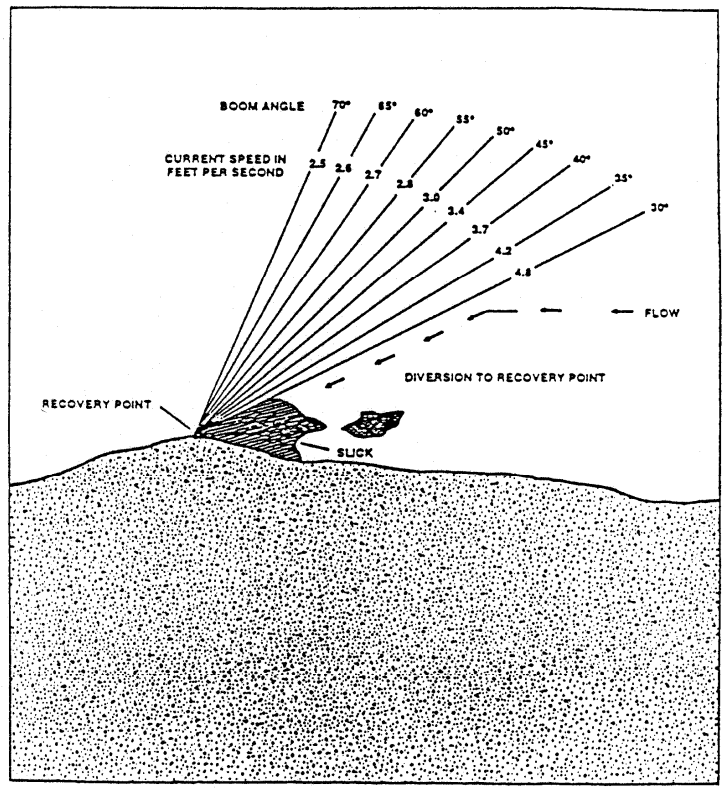


Figure 5.4 Boom Deployment Angles

Storm Drains Storm drains in the region may include buried pipes, open box culverts and lined channels. Oil entering storm drains may be lost from view and may be difficult to recover. The Spill response maps include pre-determined accessible response points for some of the major storm drains in the area. Many smaller storm drains exist or are being constructed. In cases where such drains are present, it may be possible to obtain assistance from the local Public Works Department. Explosion hazard may exist with all releases involving confined spaces. All releases to storm drains should be approached with caution.

Open Water The movement of oil on open water is governed primarily by surface currents and wind. Approximate short-term slick movement predictions can be calculated graphically by adding wind and current vectors. Surface currents will dominate spill movements unless the winds are extremely strong. Observations in actual spill situations have shown that wind will cause an oil slick to move at about 3% of the wind speed, and in the same general direction. Figure 5.5 presents an example of a graphical method for estimation of slick movement using vector addition.

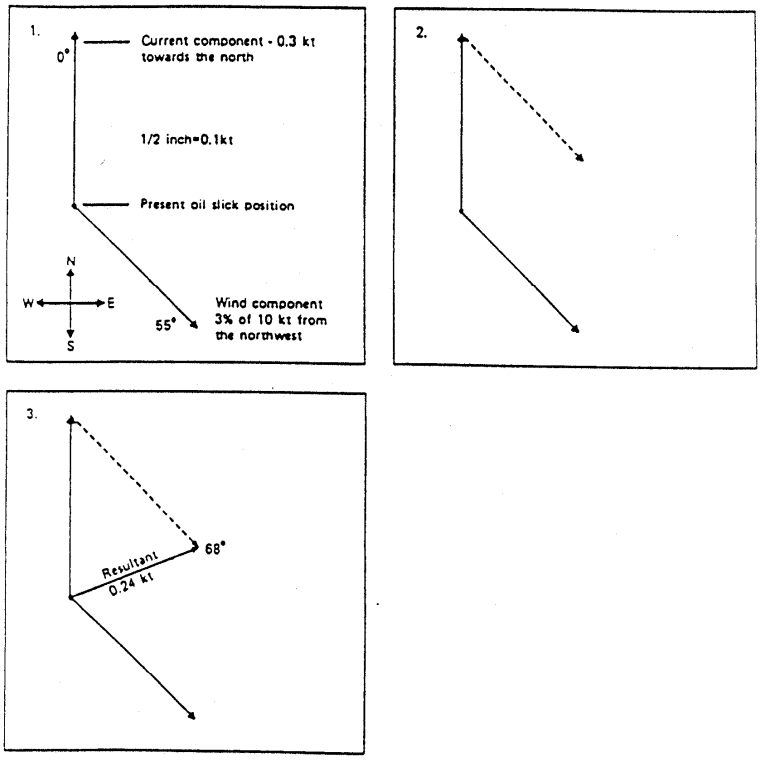


Figure 5.5 Trajectory By Vector Addition

The general procedure for vector addition is described below:

- Draw current and wind component vectors (length of vector represents velocity) in their relative directions and at a convenient scale (diagram 1).
- Draw a line parallel to the wind vector starting from the top of the current vector and extending the length of the wind vector.
- Draw a line from the point of origin (present slick position) to the top of the parallel wind vector line drawn in diagram 2. The line (the resultant) is the vector that represents the direction and speed of the slick. The direction can be measured by using the cardinal points of the compass. The speed is determined by the length of the resultant vector relative to the scale used in drawing the vector component.

5.6.2.2 Fate of Oil Model

A variety of computer models have been utilized by industry and government in predicting spill movements. NOAA may be able to provide modeling support

during an emergency. NOAA has a basic Fate and Persistence model that may be of use. This model, ADIOS 2, can provide approximation of oil behavior on water or in pools. The ADIOS 2 model can be used to develop estimates of evaporation rate, dispersion, water content, viscosity, and other factors. It can also be used to incorporate recovered oil data into a mass balance. As ADIOS was developed for open water spills, its application to land situations must be carefully qualified.

5.6.2.3 Environmental Data

Environmental data that may be useful during emergency spill response activities may include wind speed and direction, temperature, humidity, stream flow data., tidal data, current data, environmental sensitivity, land use, etc. Real time sources of information include (websites should be book marked on the Operations Control Center computer):

- NOAA National Weather Service, Pacific Region
- CERES Environmental Data
- USGS Stream Flow Data

5.6.3 Priorities

In all cases, first priority must be given to the protection of human life and protection of property. Following this consideration, and to the degree possible, actions will be taken to protect threatened resources. Where time or resources do not permit immediate response to all areas in need of protection, the following guidelines may be used to establish response priorities for available spill response assets.

The response priority decision guide presented in Figure 5.6 has been developed to assist in delegating available resources by allowing establishment of priorities.

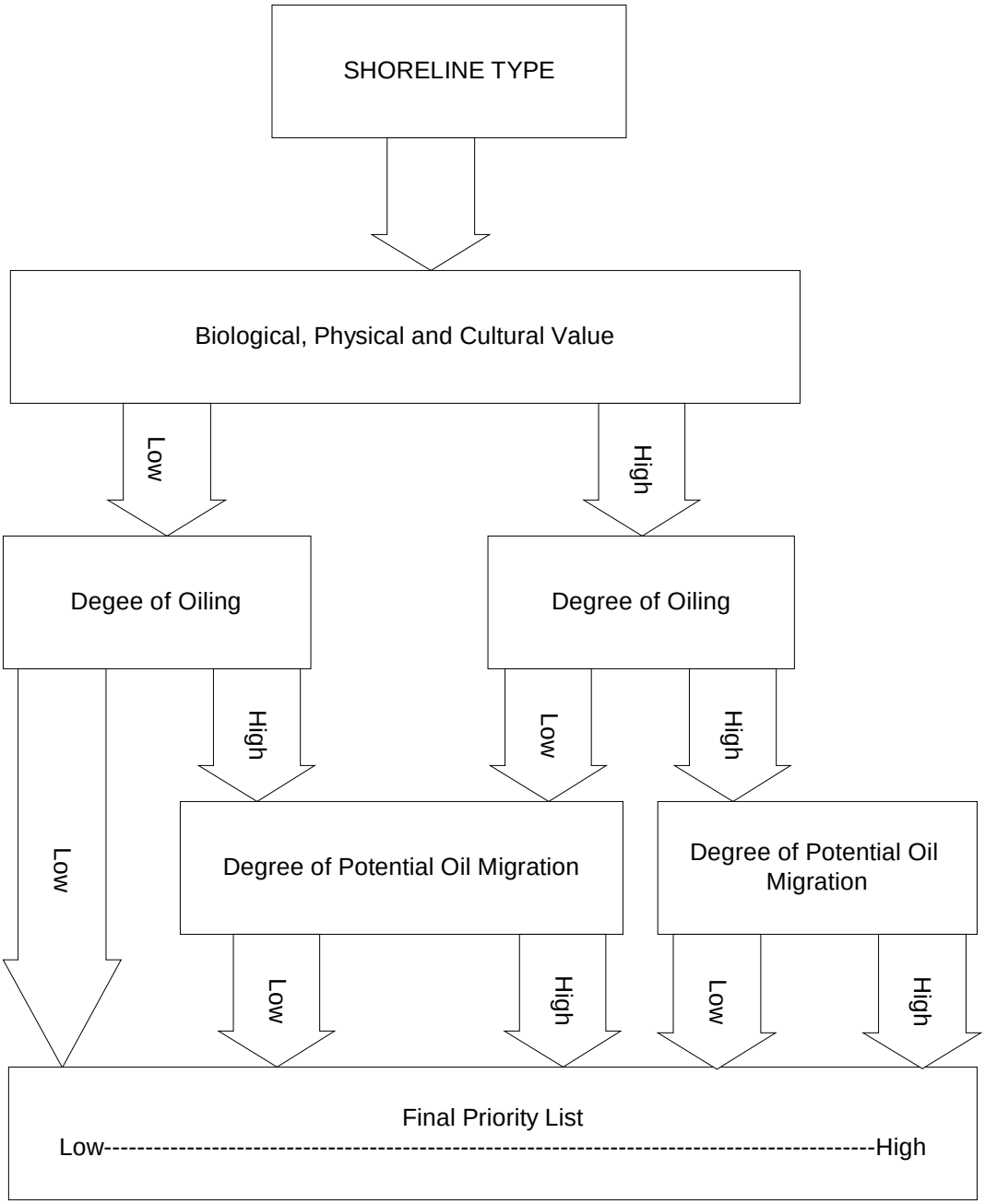


Figure 5.6 Priority Decision Guide

This decision guide applies primarily to shorelines and stream banks, although the same decision process can be applied to overland flow situations. In all cases, protection of human life (the Public, Wickland employees and contractors, and others) should receive highest priority. In all other cases, establishment of priorities will be dependent on incident-specific criteria and should be established, as necessary, by working with the unified command (if established) or with the approval of relevant agencies.

In cases where resources have already been impacted, and continuing oiling is anticipated, establishment of priorities becomes less clear and may require periodic re-evaluation.

Generally, if a highly sensitive and/or vulnerable resource has been only lightly oiled, it should probably be treated as if it were not oiled. If the resource has been heavily oiled, its sensitivity should probably be downgraded.

5.6.4 Selection of Containment/Control Actions

Containment/Control actions include those efforts intended to prevent spilled oil from spreading on land, entering a receiving water body, and limitation of damage once water bodies or other resources have been impacted. Selection of appropriate protection techniques is dependent on the physical nature of the impacted area. Four primary conditions exist along the Wickland Pipelines: Agricultural lands, commercial/industrial areas, the river habitat, and wetlands/semi-natural areas (e.g. Sacramento bypass). Appropriate actions are limited to large degree, by the characteristics of each area. Implementation guidance for primary methods is provided in Appendix C.

Agricultural lands

Agricultural lands form the bulk of areas exposed to potential releases from the Wickland pipeline. These flat areas contain numerous canal and drainage ditches, which are used for irrigation or draining of excess water. Primary containment/control actions include construction of earth or sand bag berms and dams, use of sorbent booms and construction of sorbent filter fences.

Commercial/Industrial Areas

These areas include paved and storm-drained areas and occur primarily at either end of the pipeline. Containment control actions include use of earth or sand bag berms and blocking of storm drains.

River Habitat

Fuel entering the Sacramento or Guadalupe Rivers may be contained using a combination of conventional oil spill control boom (hard boom) and sorbent boom. In general, boom should be deployed to direct floating fuel toward accessible shoreline areas where it can be contained and recovered.

Natural Areas (including wetlands)

Access to these areas may be limited and tend to be sensitive to physical disruption. Containment/control actions may be limited to low impact techniques such as sorbent booming and use of filter fences. In the event there is active flow in the bypass (i.e. flooding); attempts to contain/control spilled fuel are likely to be impractical and ill-advised for safety reasons.

5.6.5 Selection of Cleanup Actions

5.6.5.1 Cleanup Method Selection

Historically, a number of cleanup techniques have been developed to recover spilled fuels. These techniques can be grouped into two general categories: Recovery of fuel which is pooled and/or is floating on water; and cleanup of fuel which has coated or saturated soil.

Recovery of Pooled and/or Floating Fuel

Pooled or floating fuel can be recovered using vacuum trucks, pumps and skimmers, and or by using sorbents. Appropriate selection of these alternatives is based primarily on the quantity of fuel and its accessibility. Large quantities of fuel should be recovered as rapidly as possible using vacuum trucks and skimmers. If vacuum truck access is limited, portable tanks and drums can be used for storage. For situations involving light concentrations of fuel and/or sheen, sorbent recovery may be more appropriate, keeping in mind that aviation turbine fuel has low persistence and will evaporate rapidly.

Cleanup of Fuel Saturated Soil

Spilled fuel may penetrate into soils where it may persist for considerable periods of time. The fuel contains toxic components, which may necessitate its cleanup. This may be particularly true for agricultural lands. Several approaches can be attempted, including disking to accelerate evaporation, and bioremediation. If necessary, excavation of contaminated soil may be required. Each situation must be evaluated on a case-by-case basis.

5.6.5.2 Natural Recovery

As a general philosophy, accumulations of spilled oil should be recovered to the maximum practical extent. However, attempts to recover all of the spilled material may result in greater overall damage than partial, or even no recovery. Oil is biodegradable, and in many cases, allowing natural recovery to remove residual material may be the most environmentally acceptable alternative. Natural recovery should always be considered as a potential cleanup alternative and considered with the Incident Command.

5.6.5.3 Spilled Fuel Fate and Behavior (Predicted)

Aviation turbine fuel is classed as group 2 oil under OPA ’90. Group 2 fuels are distinguished by relatively low persistence. The EPA ADIOS Model fate and persistence was run for the SMF and SJC Pipelines. The following parameters were used in the calculation:

- Oil Type: Jet A
- API Gravity : 43.0
- Pour Point : -51. deg C
- Flash Point: 40 deg C
- Viscosity: 1.2 cSt @ 40 deg C
- Wind speed: 5 mph

- Temperature: 75 deg F

SMF Pipeline

The WCD scenario (Segment 3) was run as an indication of the probable fate of released turbine fuel. The spill parameters include:

- (b) (7)(F) [redacted]
- Duration of release: 4 hr.
- Time of spill: 1100 hrs.

Based on these properties, ADIOS estimated that 50% of the release would evaporate in approximately 9 hours, with the entire release evaporating in approximately 2 days. Evaporative loss predicted by ADIOS is plotted in Figure 5.7. At higher temperatures and wind speeds, the evaporation rate would be expected to be considerably less.

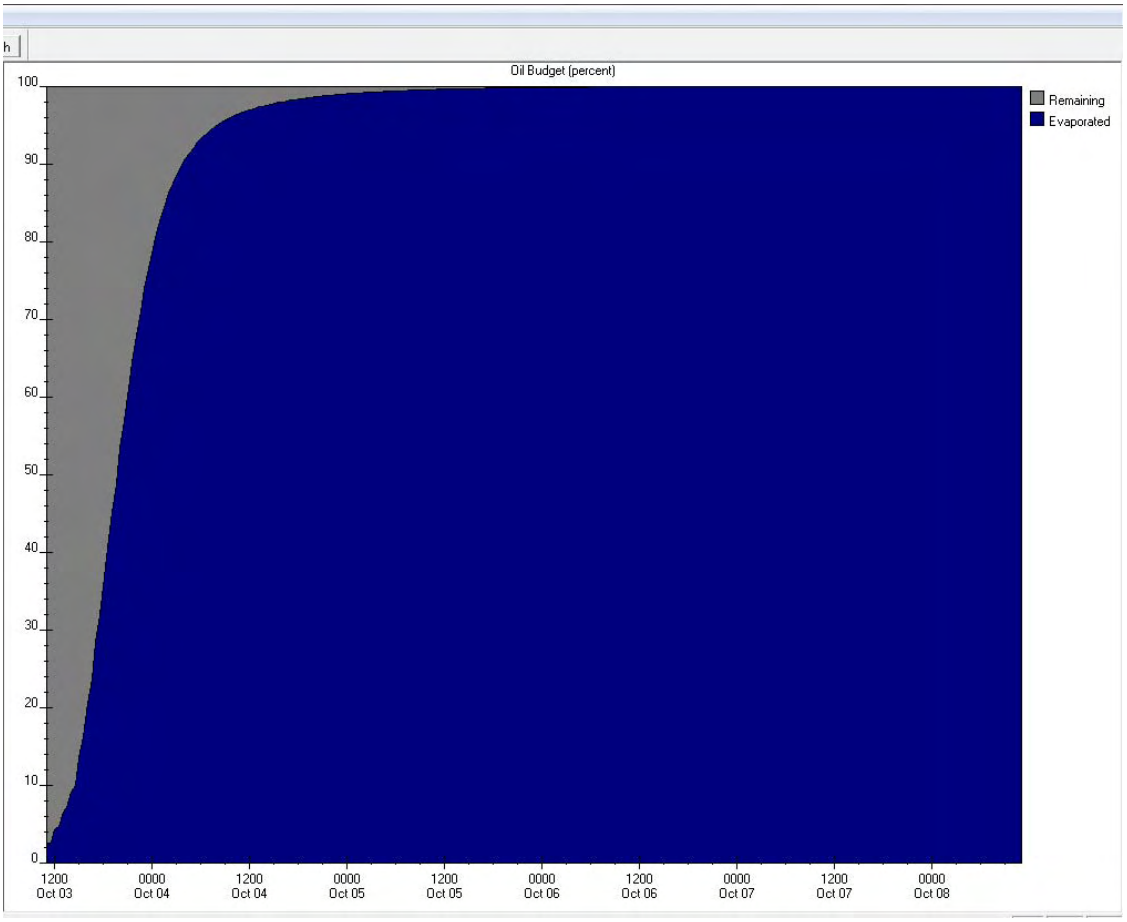


Figure 5.7 ADIOS Calculation of WCD Evaporation for SMF Pipeline

SJC Pipeline

The WCD scenario (Segment 3) was run as an indication of the probable fate of released turbine fuel. The spill parameters include:

- (b) (7)(F) [redacted]
- Duration of release: 4 hr.
- Time of spill: 1100 hrs.

Based on these properties, ADIOS estimated that 50% of the release would evaporate in approximately 5 hours, with the entire release evaporating in approximately 2 days. Evaporative loss predicted by ADIOS is plotted in Figure 5.8. At higher temperatures and wind speeds, the evaporation rate would be expected to be considerably less.

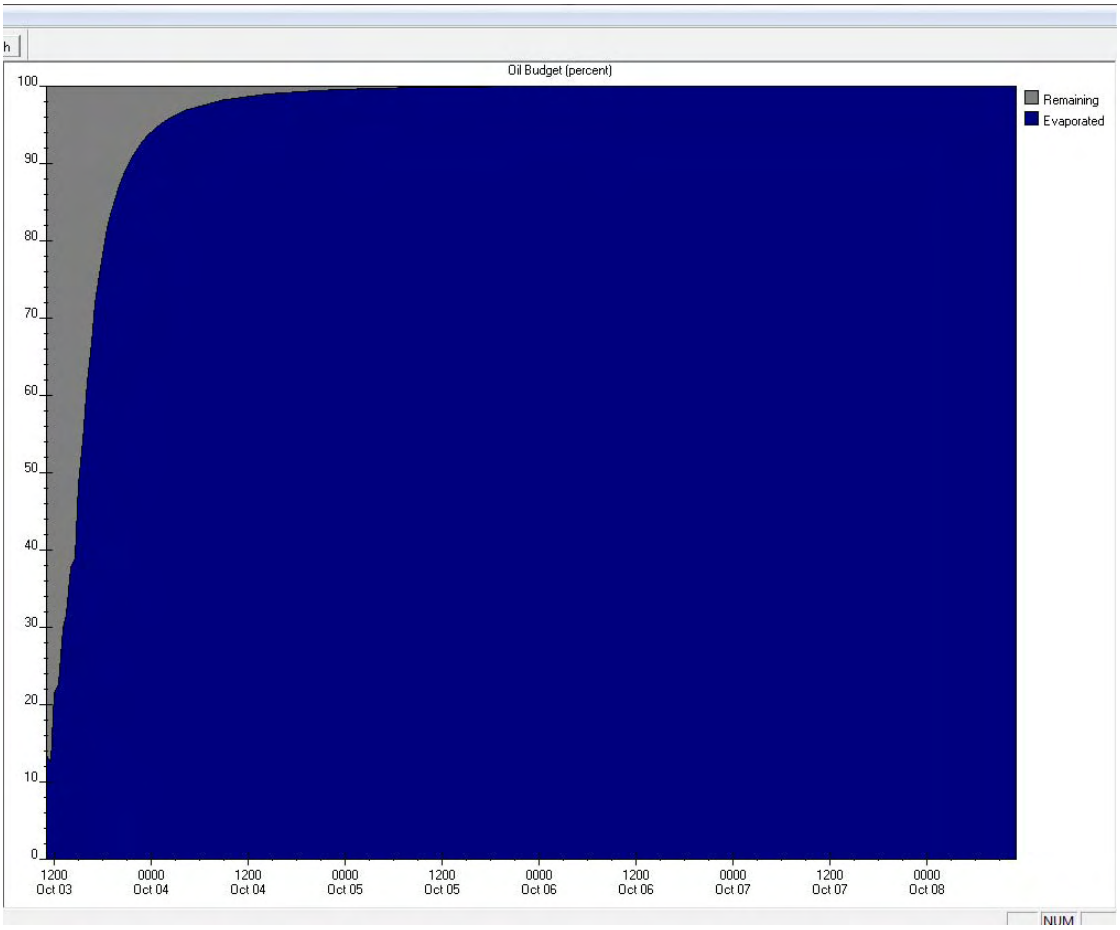


Figure 5.8 ADIOS Calculation of WCD Evaporation for SJC Pipeline

The ADIOS model does not account for fuel which may penetrate into soil. In this situation, spilled material would be expected to persist for

longer periods of time, potentially requiring some form of remediation (excavation, aeration, etc.). However, groundwater in the region is typically high and may be at the surface on occasion. Under these conditions, minimal soil penetration would be expected.

5.6.6 Equipment Selection and Operation

5.6.6.1 Overview

A wide variety of oil spill response equipment is available and may be offered for emergency response. Much of this equipment has been designed for specific applications and oil types, and may or may not be appropriate for use on jet fuel spills. Only equipment appropriate for fuel should be used, ordered or accepted. Use or stand-by charges will generally be assessed for any equipment mobilized. In addition, use of inappropriate equipment will generally waste time and result in a wider spread of contamination. Even the correct equipment is often used incorrectly, also resulting in unnecessary costs and potential spread of contamination.

The following section provided basic guidance for selection and application of booms, skimmers and pumps.

5.6.6.2 Booms

Booms must be correctly selected and deployed to function in containment, deflection, or exclusion modes. In addition, boom deployments require periodic adjustments, maintenance, and regular removal of collected oil and debris. The following sections provide guidance on boom selection, with emphasis on shallow water/inland applications.

- Type

A variety of boom types may be available, including skirt booms, fence booms, inter-tidal booms, fire proof booms and inflatables. Select booms that are of appropriate size for the intended application. As a general rule, fence booms are less effective along shorelines and in currents. The preferred boom type for stream application is the skirt or curtain boom. Inflatable booms can be deployed very rapidly and are acceptable for short-term deployment. Tidal boom has potential application along shorelines and in wetlands. Tidal boom uses water-filled lower bladders to achieve a conforming seal on the bottom.

- Boom Size

In flowing water situations, the boom cannot extend to the bottom. For stream applications, relatively shallow skirt booms are recommended (12 inch skirt typical). This size boom is readily transportable and easily deployed by small crews or from small boats.

- Boom Location

Boom locations are normally selected according to the following criteria:

Accessibility. Rapid deployment is essential. In most cases, deployment sites are located at the first existing access points downstream from the release. Many of these sites have been located on the spill response maps.

Natural collection points Wind, currents, stream geometry, and other factors create locations where oil will accumulate naturally. Typically, such areas are associated with lower flow velocities and form ideal boom locations (if they are accessible). Natural collection points can normally be identified by presence of accumulated debris. If the sites have significant debris accumulations, the debris should be removed or pushed above the water line prior to oiling, if possible. Failure to pre-clean such areas will result in increased cleanup and disposal requirements.

Deployment Angles Oil Booms will generally function satisfactorily at flow velocities up to 1 knot (about 1.7 fps) perpendicular to the boom axis. Some degree of boom failure can be expected at any higher flow velocities, certainly over 1.5 knots (2.5 fps). Boom performance can be improved by deploying the boom at an angle to the current (see figure 6-3). Deployment of a single boom is frequently inadequate, particularly if currents over one knot are present. Multiple boom installations angled toward the collection point are usually advisable.

Shoreline Termination A common problem in successful boom deployment is failure to maintain a proper shoreline termination or seal. A proper shoreline termination can be achieved by burying the boom skirt across the shoreline, by using sorbents to fill and void spaces, or by attaching the boom to an earth, plywood or sandbag dike.

Boom Maintenance Failure to monitor and maintain an installed boom is one of the most common causes of boom failure. Once deployed, booms are exposed to water level variations, dragging anchors, and fouling or damage by floating debris. All of these factors can cause the boom to become twisted, stranded, moved to a new location, or torn. Booms can also reach their containment capacity, at which point oil will be carried under the boom. It is imperative that boom deployments be monitored at least daily and adjusted or repaired as necessary. Accumulated oil should also be removed at regular intervals. Boom that is no longer functional should be removed as soon as possible. If oil movement has not been stabilized, clean boom may be temporarily “wet stored” at an adjacent clean site pending reuse.

Debris Heavy debris loadings can be expected in many situations. Floating material not only damages boom, but also can significantly increase the size and difficulty of the cleanup effort. Application of debris control booms (cables, lengths of chain link fence, etc.) upstream of conventional boom deployments are recommended where debris loadings are high.

5.6.6.3 Skimmers

A wide variety of types and sizes of skimmers are available. In consideration of Wickland's operating environments, the following discussion is limited to portable skimmers that are easily transportable by truck or helicopter, and can be used in remote or confined areas, including streams and wetlands. Skimmers can be classified according to their basic principle of operation. The following discussion addresses the applicability of each respective type to fuel recovery and operating conditions:

- Rope Mops

An endless sorbent rope or mop is pulled through the oil between a pulley and a wringer device. The wrung-out rope is then returned to the water surface and the process repeated. Rope mops can operate in any water depth and on solid irregular surfaces in some cases. They do not recover debris. They are less effective in recovery of light oils, but offer the advantage of being able to operate in very shallow and irregular areas. Small units are available which fit on the top of oil drums.

- Brushes

Closely spaced brushes are used to pickup oil from the water surface, after which it is transported to a comb-like device that scrapes the oil into a collecting trough. The devices are not generally affected by debris, currents or wave action. Hand - held mop-like brushes are also available and have application on land and shorelines. They are not generally effective for distillate fuels.

- Weirs

Many versions of weir skimmers are available locally. They all operate by using a weir to separate the floating surface layer of oil from the water. The recovered material, which contains some water, is pumped to storage using a wide variety of pumps, including auger pumps that tend to improve the heavy oil handling capability. They will collect large amounts of water unless the oil is concentrated. The smaller weirs are generally simple and easy to operate devices, and applicable for use in streams or other restricted areas. They are most effective on light to medium oils. Weirs are sensitive to floating debris, although some of the larger units contain debris cutters and pumps capable of handling solids.

- Vacuum Units

Vacuum recovery includes the use of vacuum trucks. These trucks are typically attached to floating skimmer heads, and are designed to recover the floating surface layer. As with weirs, they will recover varying amounts of water, and require oil to be concentrated to be effective. Depending on type, they can work effectively with any fluid oil. They are very sensitive to debris clogging.

- Nets and Trawls

Nets and trawls can be used for the recovery of solid or highly viscous oils, but are not effective for distillate fuels.

- Open Water Recovery

In the event is discharged into the Sacramento River or Guadalupe River, application of one or more larger skimmers or skimming vessels may be appropriate. Skimming systems are available from NRC.

- Storage Limitations

Regardless of the quantity of oil present and skimmer effectiveness, all skimming operations are ultimately limited by the ability to store the collected oil and water. This aspect of the response effort must be given priority consideration in the design of the response program.

5.6.6.4 Pumps (Transfer Systems)

Pumps and/or transfer systems may be needed to operate many skimming systems and to move recovered oil from on-site containment to trucks or other containment. Following are brief descriptions of the more common pumping and transfer systems that may be available:

- Pumps

A variety of portable pumps are manufactured. Those most commonly applied to oil spill response include centrifugal, diaphragm and screw - auger or progressive cavity pumps. Fluid lifts are generally limited to less than 30 feet, and this must be considered for operations around levees.

Centrifugal pumps use a high speed impeller to move the oil. Commonly gasoline powered, they have particular application for driving water spray and flush / flood systems. Some are sensitive to debris fouling, and viscous oil, and all will tend to cause emulsification (not desirable). “Trash” pumps have higher tolerance to debris.

Double diaphragm pumps are typically pneumatically powered and will require a source of compressed air. They are commonly used to drive portable skimmers (DD pumps generate a pulsating flow which creates problems with some skimmers) and are effective in handling debris.

Auger and progressive cavity pumps are effective with viscous oils and can accommodate moderate debris loadings. They can be used for most skimmer and transfer operations.

Vacuum Transfer systems include vacuum trucks and portable vacuum units.

Vacuum Trucks are commonly available and capable of handling fluids of almost any viscosity and some solids. They can also accommodate most types of smaller debris. They can be used to operate most portable skimming systems and create minimal emulsification.

5.6.6.5 Sorbents

A variety of sorbents is available and should be selected according to oil type and intended application.

- Boom

Sorbent boom typically consists of sausage-shaped mesh bags filled with sorbent material. Boom sections may be fastened together and can be used as a physical barrier much as conventional booms are used. Use of sorbent boom in this mode is limited to calm low-flow conditions and relatively thin oil accumulations.

Sorbent booms can also be deployed behind conventional hard-boom to catch sheen which is not contained.

Sorbent booms will be more efficient with fuels and lighter oils which will penetrate into the boom interior. All sorbent boom applications should be inspected and rolled over periodically for maximum efficiency

- Pads

Pads have multiple applications including recovery of oil on water surfaces and on shorelines and for general cleanup. Pads should not be deployed in situations where they cannot be recovered. Workers should be instructed to turn each pad and exhaust its absorptive capability prior to using a new pad.

- Snare

Snare typically consists of thin strips of plastic fastened in a mop-like configuration. Snare is particularly effective on heavy oil, but will have little application to fuel spills.

- Sweeps

Sweeps consist of series of sorbent pads connected along a rope. They are typically used to recover thin oil layers. They can also be deployed on shorelines to collect incoming oil.

- Rolls / Rugs

Roll sorbent can be used to protect and/or recover oil from flat surfaces (land or water). They are particularly useful for oil recovery in salt pans and for protections backshore areas and work areas.

- Loose / Granular

Loose sorbent is effective in collecting oil from flat surfaces such as streets. In addition to collecting oil, they also immobilize it, preventing penetration into soils. They may also be effective as a filler for filter fences (fine mesh only) and for recovery of oil in irregular areas such as wetlands and mangroves. In general, loose sorbents should not be applied without provisions for their recovery.

5.6.6.6 Chemical Agents

- Dispersants

As used herein, the term dispersants is used to refer to oil dispersing agents and low toxicity cleaning agents. In general, dispersants will not be considered for inshore water application, with the possible exception of cleaning of docks and industrial areas. Cleaning agents may also be of assistance in cleaning land sites. It is important to note that presence of dispersants may render sorbents and some types of skimmers ineffective.

- Oil Lifters

This term refers to a class of chemicals that loosen oil from surfaces, allowing it to float to the surface. In contrast to dispersants, the oil / oil lifter mixture remains intact and can be recovered with skimmers.

5.6.6.7 Biological Agents

- Engineered Bacteria

Genetically engineered oil consuming bacteria are available. However, there is commonly public resistance to their use and there are questions whether they offer any particular advantage over bio-stimulation by nutrient addition.

- Nutrients

Existing bacteria will consume hydrocarbons. The rate at which this occurs can be enhanced through addition of nutrients (typically nitrogen and phosphorous) or bio-stimulation.

- Aeration

Aeration involves turning or tilling the soil to allow exposure to air and facilitate evaporation.

5.6.7 Cleanup Criteria

5.6.7.1 Guidelines for Removal of Oiled Vegetation from Streambeds

(Note: The following Guidelines were developed for removal of oiled vegetation from the Santa Clara River during the January 17, 1994 Northridge Earth Quake and Oil Spill. Every oil spill will have its own set of variables, and each must be assessed on its own merits. However, the oiled vegetation removal guidelines developed during the Northridge Event may be used as a model for development of incident-specific guidelines for the Santa Clara River and other local drainages.)

“Workers will cut the watercress that is heavily oiled utilizing shovels. Workers are not to attempt to cut watercress that is above the level of water (rooted in dry sediment). Workers should avoid uprooting remaining vegetation and roots.

Workers to place sorbent pads and boom in open pools of oil to prevent contamination of un-oiled areas.

Workers will begin at the easternmost [upstream] section of oiled vegetation and proceed westward [downstream].

Collection points are to be located as frequently as practicable and optimally no further than 1/2 mile apart. Collection points will utilize fence material to catch the vegetation. Workers are then to herd the vegetation to the shore where mechanical recovery can take place. It is not intended that these collection points be oil recovery sites.

Three-inch water pumps are to be rigged using water from the river to power low-pressure hoses that will be used to flush oil away from the shore and away from the areas around dry vegetation.

Once it is determined that the area is clean, workers will walk each section of the river to pick up any loose oiled vegetation that was not collected.

If access to remote collection sites requires operation of heavy equipment to utilize the streambed, they must receive permission from the site supervisor.

Cut vegetation from standing or flowing water may be floated down the river to collection sites. Otherwise, the cut vegetation must be bagged and removed from the site."

(Source: Leveille, T.P., et al, 1995, International Oil Spill Conference Proceedings.)

5.6.7.2 Standards for Determining Cleanup Endpoint

(Note: The following Standards were developed for determining the cleanup end point for activities on the Santa Clara River following the January 17, 1997 Northridge Earthquake. Every spill will have its own set of unique variables, and each must be assessed on its own merits. However, the standards that were established for the determination of the endpoint for cleanup during the referenced event may be used as a model for future spills into the Santa Clara River or other adjacent drainages)

"The following guidelines will be used to determine when individuals segments will be considered for signoff. Segments will be signed off sequentially to insure that no recontamination of downstream segments will be possible. Once a segment has met the listed criteria, a team of three people will visit the site for inspection and potential signoff. The team will consist of one representation from (the Responsible Party), one representative from California Department of Fish and Game, and one federal representative that will be from the US Fish and Wildlife Service. The three entities being represented should choose two people to be team members to allow for multiple teams and/or allow for flexibility in scheduling site visits. Team members should be designated in advance and every effort should be made to keep these representatives consistent throughout the sign-off procedure. All

representatives must have signature authority from their respective agencies to participate in this process.

All segments must meet the following criteria:

- There shall be no free oil remaining either on the river or in the sediment.
- There shall be no oily debris remaining on the shore or trapped amongst the vegetation.
- Only a dry stain may be left behind. No wet oil is to be left on the shoreline or vegetation. Wet oil must be removed from the shoreline and any impacted vegetation must similarly be removed.
- Trenches must be dug to ensure that there is no buried oil in the sediment. (If buried oil is discovered then (Responsible Party) must submit an action plan detailing the removal and/or remediation).

When (Responsible Party) believes a segment meets these criteria, then a walk through by the cleanup assessment team can be scheduled. The decision by the team that the segment is clean must be unanimous. Otherwise, the team will issue specific additional cleanup recommendations for those areas that do not meet these criteria."

5.6.7.3 Cleanup Criteria – PEPCO Oil Spill.

Criteria developed during the PEPCO 126,000 gallon heavy oil spill in Maryland, 2000 were developed for two cleanup phases using field applicable observations. The initial phase of cleanup addressed the period during which oil was mobile. Criteria developed for Phase 1 included:

Sandy Beaches

Free of substantial mobile liquid or black oil. Staining may be present. Rainbow sheen may be present.

Man-Made Structures

Riprap, pilings, docks and seawalls free of bulk oil and not producing unacceptable brown sheen.

Vegetation

Free of pooled oil and potentially mobile oil.

Phase 2 (Final Cleanup Criteria) included:

- Sandy Beaches

Clear of all oil so that a sorbent pad placed on the area does not stain; minimal staining visible, no rainbow sheen.

- Man-Made Structures

Clear of recoverable, potentially mobile oil; Minimal staining so that a sorbent pad placed on the area does not stain; no rainbow sheen.

- Vegetation

Clear of recoverable, potentially mobile black oil; Minimal staining: No rainbow sheen on the sediment, soil, or water.

5.6.7.4 Restoration

Restoration of impacted areas may be required in some cases. While restoration is normally beyond the scope of emergency response, there is potential reduction in the overall all disruption of an impacted area, and cost saving associated with combining cleanup and restoration into a single operation. Inclusion of restoration in the cleanup operations should always be considered.

5.6.8 Decontamination (DECON) Procedures

5.6.8.1 Personnel DECON

Personnel DECON stations must be established at one or more safe and secure locations at the point(s) of ingress/egress to the contaminated area. The station(s) should typically include a bermed area covered with a plastic tarp or liner and should have sufficient space to accommodate DECON stations in a linear fashion. Personnel DECON stations should be covered with canopies, and have clean a dress-out station. It is helpful to have benches and assistants stationed at high use areas to distribute PPE and assist with the dress out. For large incidents, it may be useful to document checkout of major re-useable PPE such as boots, waders, hard hats, rain gear, etc.

Full personnel DECON stations should have 5 stations:

- **Station 1** - Scrub boots and gloves with oil cleaner (such as citrus-based cleaners) and wipe off excess with sorbent pad. Two tubs having cleaner and rinse water respectively may be appropriate.
- **Station 2** Remove Tyvek or other protective clothing, starting from top down. Place soiled clothing in plastic bags for disposal. Boots and gloves may be reused if clean inside and not damaged.
- **Station 3** Remove hard hat and goggles/face shield.
- **Station 4** Remove all remaining oil from skin or clothing (in necessary change clothing). Wipe any affected area with clean rags or paper towels. Citrus cleaner or baby oil are excellent for removing heavy oil from skin.
- **Station 5** - First aid and eye wash station to be used as needed.

5.6.8.2 Equipment DECON

Equipment DECON stations should be established at selected staging / launch areas. Stations should be secure and large enough to contain equipment to be decontaminated, washing equipment, waste and waste water collection system (including storage tanks), fork lifts, DECON personnel, and DECON

supplies. Sufficient space should be included to contain splash-over from washing and steaming operations. Metal plates or other protection may be necessary to protect liners in cleaning areas. All wash water and other contaminated materials must be collected and contained for proper disposal. It is useful to locate the equipment DECON station near a secure area where cleaned equipment can be stored.

5.6.9 Demobilization

Demobilization is the process of releasing equipment and resources when they are no longer needed. Because of the expense associated with maintaining response resources, the demobilization process should be initiated at the beginning of the response, not at its end. Demobilization procedures apply to spill response equipment, contracted personnel and Wickland employees.

The process should include decontamination and repair of equipment, and if personnel are included, debriefing and return of all reports, logs, photos, and other documentation. However caution must be exercised to ensure that resources are not released prematurely.

5.7 Wildlife Care

5.7 .1 General

In the event of an oil spill, wildlife may come into contact with oil, especially on the surface of water or along shorelines or stream channels and banks. The numbers of individual animals and species affected will depend on the number of variable factors, such as location, the size of the spill, weather, wind and currents, habitats affected, and the time of year that the spill occurs. The most likely wildlife to be affected is birds, although invertebrates, fish, amphibians, reptiles and mammals can be affected. Response workers and the general public are likely to encounter oiled wildlife and the public may desire or demand to assist in their collection and rehabilitation.

The State of California has a well developed wildlife care network. It is assumed that OSPR will assume the lead role in wildlife care because:

- They are the lead state trustee for fish and wildlife;
- They have permits and agreements with other agencies for special status species and other protected wildlife;
- They has legal mandate to protect wildlife;
- They have the needed expertise, training and experience; and
- They have access to the wildlife care network (statewide cooperative system of specialized wildlife health centers and organizations (including the UC Davis Wildlife Care Center) see: www.owcn.org.

A Typical wildlife response mobilization organization and sequence is shown in Figure 5.9.

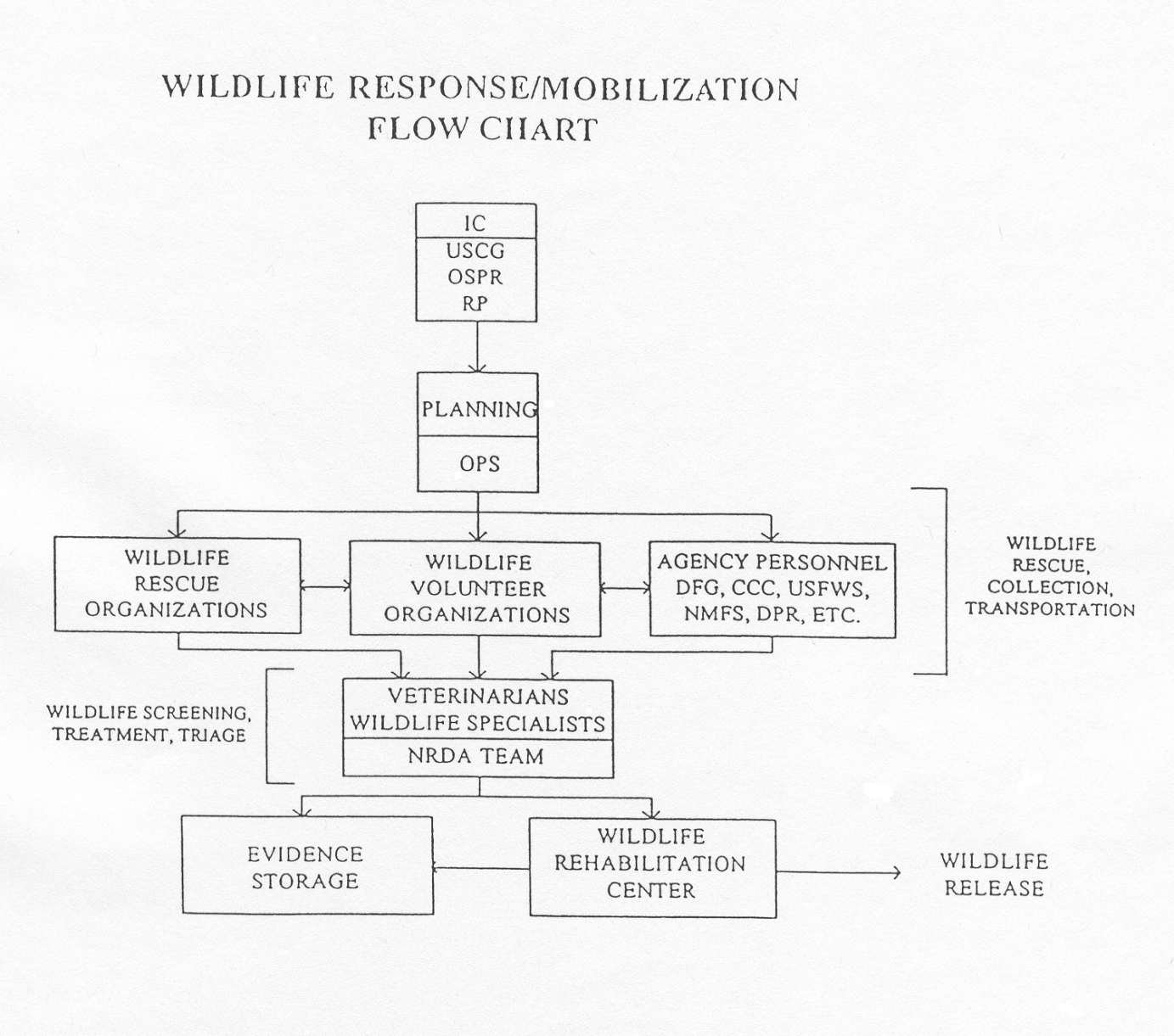


Figure 5.9 Wildlife Response Mobilization Flow Chart

5.7.2 Wildlife Care Plan

An initial step in responding to oiled wildlife issues involves development of a wildlife care plan. Following an initial evaluation of the magnitude and severity of a potential oiled wildlife issue, Wickland's Wildlife Response Coordinator will work with OSPR and federal agency representatives in the development of a Wildlife Care Plan which will address the specific requirements of each incident.

This Plan should include consideration of organization and training of personnel, required permits, implementation of wildlife avoidance procedures (if appropriate), establishment of wildlife collection points, establishment of a public information telephone number, establishment of rehabilitation centers, logistics requirements, documentation procedures, and so on. The Wildlife Care Plan must be submitted to the IC for approval prior to implementation.

5.7.3 Permits

The Wickland Wildlife Response Coordinator will work with appropriate state and federal agency representatives to ensure that all applicable permits or waivers are in place.

5.7.4 Required Training

All persons (including volunteers) conducting wildlife rehabilitation, whether it be the collecting, cleaning, feeding or releasing of animals, are required to have a minimum of 4 hours of training in animal handling, animal care safety, and rehabilitation in order to comply with OSHA requirements and to insure the safest handling of wildlife. An additional 4 hours of HAZWOPER training is required for handling wildlife that has not been cleaned of oil.

5.7.5 Volunteers

Wickland does not utilize volunteers for insurance reasons. However, Wickland will provide support for qualified volunteers for wildlife care, providing that they are under the direct supervision of state and/or federal agencies. Before volunteers can work with birds that have not been cleaned of oil, they will require 4 hours of HAZWOPER training.

5.7.6 Land Animals

If the owners of the animals are readily identifiable, the owners should be contacted and directed to contact a professional veterinarian. Veterinarian costs should be documented so the owner can file a claim for recovery of damages. If the animal is wild or the owner is not readily available, trained oiled wildlife capture/recovery teams will be required.

5.7.7 Hazing

Hazing involves scaring animals (typically birds) away from contaminated areas. Hazing efforts have historically met with mixed success, and should be used only after consultation with state and federal representatives and approval by the Incident Command.

5.7.8 Collection of Oiled Wildlife

Response operations may encounter dead or injured wildlife. If stopping operations to await the arrival of capture/recovery teams would result in a significant delay, operators are permitted to collect and hold wildlife pending pickup by recovery teams. An immediate report must, however, be sent to the Command Center.

5.7.9 Disposition of Dead Animals

All dead animals collected should be tagged, bagged and placed in cold storage, or as other wise directed by state and federal representative.

5.7.10 Resources

Wickland will rely on OSPR/OWCN for support in the management of oiled wildlife issues.

5.7.11 Documentation

Documentation of all wild life collected must be maintained. Documentation should include:

- Date and location
- Condition
- Treatment provided
- Release or other disposition
- Other information as appropriate or directed in the Wildlife Care Plan.

5.8 Permits for Response Actions

Oil Spill response operations can involve activities which require permitting. The nature of these permits is dependent on the specifics of the activity and situation, and must be determined at the time of the incident. Representative activities that may require permitting include:

- Damming and/or diking of waterways
- Collection of living/dead and disturbance of living animals
- Construction of any structure affecting navigable waterways
- Activities involving threatened or endangered species, migratory birds, or wildlife refuges
- Selection and use of temporary storage areas
- Waste disposal
- Use of novel treatment techniques

In many situations, emergency or expedited permits can be obtained. All response activities will be subject to review and approval by the Incident Command. Agency representatives on the Incident Command will be available for assistance in identification and securing of any necessary permits.

5.9 Waste Handling and Disposal

5.9.1 General

It is Wickland's objective to remove spill-generated wastes from impacted areas in an environmentally sound manner, as rapidly as possible. Proper

classification waste streams and their segregation at the time of collection are effective in minimizing the volume of wastes requiring special treatment and can significantly reduce costs of waste handling and disposal. Specific waste handling and disposal requirements will vary depending on the type of oil released, location, cleanup procedures utilized, and other factors. A typical waste handling scheme is shown in Figure 5.10.

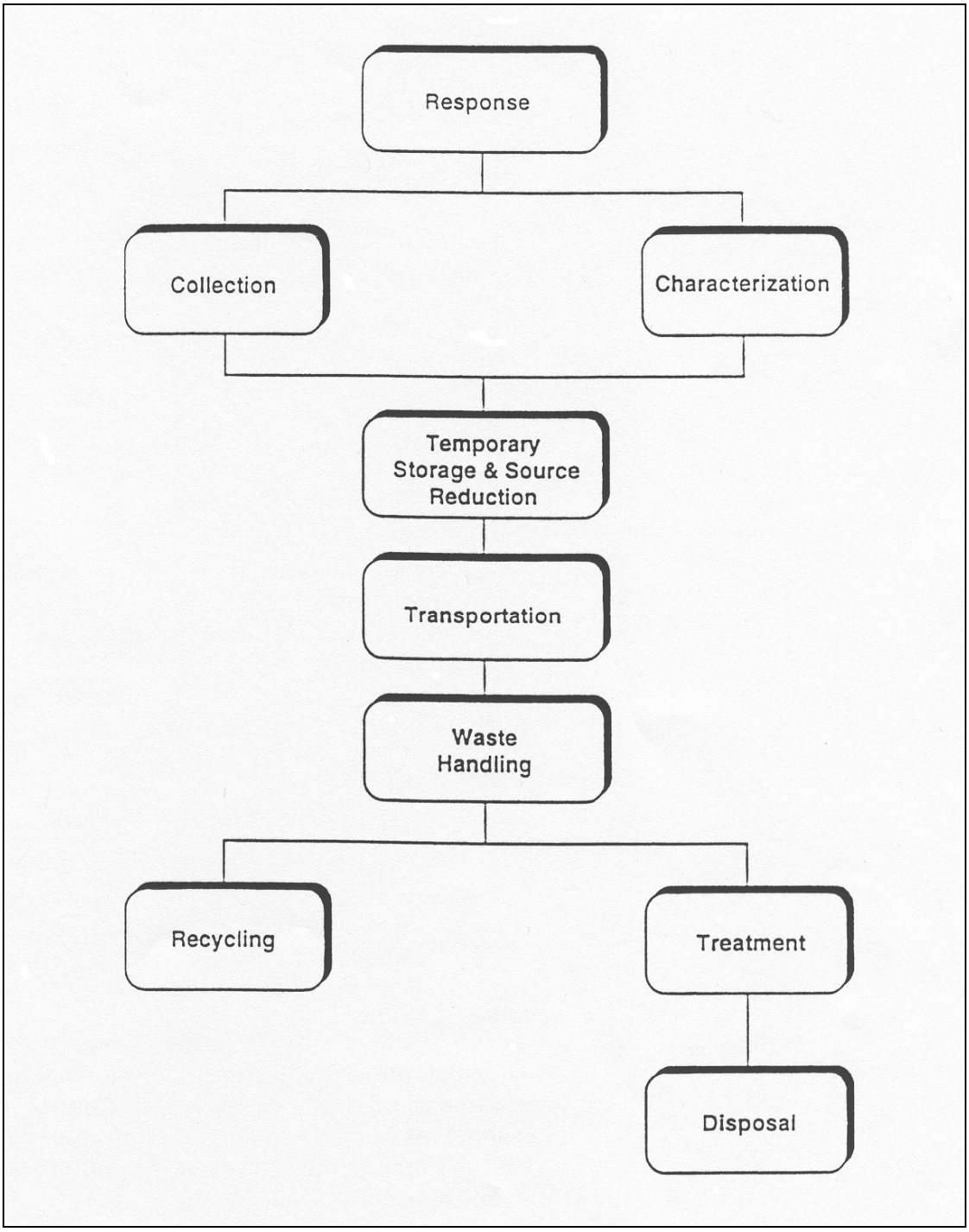


Figure 5.10 Flow Chart: Handling of Oil Spill Waste

5.9.2 Waste Minimization and Segregation

Oil spill control and cleanup activities generate significant volumes of waste materials, many of which will require different level of treatment. Waste minimization and segregation (field separation) of waste streams at the time of initial collection can significantly reduce disposal effort and overall costs. Failure to field implement waste minimization and segregation early in the response can result in the need for additional efforts later in the response. Some guidelines for waste minimization follow:

5.9.3 Solid Waste

Do not mix any oil, fuel, or oily wastes with trash, garbage or any other non petroleum-contaminated materials.

Prevent recovered oil from contaminating soil. Use berms and liners around work areas.

Turn sorbents until they are moderately to heavily exhausted.

Bag or store spent sorbent and PPE separately from other materials.

Minimize the amount of clean sand or soil removed from under oiled areas.

Watch for materials that may not be related to the cleanup activity (report to authorities).

Segregate tar balls and pieces of "pavement" if practical to do so.

5.9.4 Liquid Wastes

Store pure oil separately (minimize free-water component).

Store oil: water mixtures that contain freshwater or seawater separately, if possible.

Properly train and supervise personnel involved in skimming and vacuum operations to operate equipment with minimal water recovery.

To the degree practical, cover all fuel and waste storage containers and containments, to minimize collection and contamination of accumulated rainwater.

Don’t order more chemicals / solvents than are reasonably needed.

Use cleaners sparingly, and do not use excessive amounts of wash water for flushing.

Watch for materials that may not be related to the cleanup activity (report to authorities).

5.9.5 Temporary Transfer / Storage

Temporary locations for recovered solids and liquids are commonly needed to maximize recovery efficiency. The preferred method of storage is in roll-off dumpsters for solids or baker tanks for liquids. Dumpsters should be lined and covered as per standard industry practice. If sufficient dumpsters are not available, sites may be prepared by installing two layers of 6 mil plastic sheeting and appropriate berming to contain drainage. Sites should be near the location of field activity, and should have the following characteristics:

Sites must be secured and access must be restricted.

Sites must have controlled drainage, both surface flow and permeability.

Ingress and egress areas for heavy equipment must be maintained in a fashion that does not compromise the integrity of the site liner, if any).

Consideration must be given to covering the material to prevent excessive rainwater from accumulating in any bermed area. Covering may also be required if debris may be blown by wind

5.9.6 Temporary Storage Containers

Recovered oil, oily liquids and oily solids will require immediate and safe storage until they may be processed. The ability to handle and store recovered materials is particularly critical early in the spill response. A variety of temporary storage alternatives for solids and liquids are available for short-term storage, and representative examples are listed in Table 5.1.

Type of Storage	Immediate Response	Longer Term
Lined earthen pit		X
Earth bermed pit	X	X
Prefabricated (Quick) Tank	X	X
55 Gallon Drum	X	X
Baker / Fractionation Tank		X
Livestock Tank	X	
Tank Truck	X	
Vacuum Truck	X	
Dump Truck (solids)	X	
Dumpster (solids)	X	X
Bowser	X	X
Plastic Trash Bags (solids)	X	X
Plastic Swimming Pool	X	
Boom	X	
Pillow Tank	X	X

Table 5.1 Typical Temporary Storage Containers

5.9.7 Decanting

Decanting is the process of draining off recovered water from portable tanks, vessel tanks, tank trucks, or other containers into which oil: water mixtures are

introduced. Decanting may be used with approval of the State/Federal OSC. When decanting is conducted properly, most of the water generated in the collection process can be removed, concentrating the recovered petroleum.

Vacuum trucks are routinely used for oil recovery along shorelines, streams, drainage canals, and inland. Prior to using an uncleaned vacuum truck for the collection of oil, with planned decanting of water, truck records should be checked to ensure that there are no contaminants from previous activities, and that any resulting decanted water will be safe to discharge back to the environment.

5.9.8 Waste Transportation

Licensed transporters will be used to transport recovered materials and wastes. Wickland's primary response organization is a licensed transporter.

Drums can be used to transport materials that are flammable. Waste materials should always be covered during transportation. All truck beds and bins should be lined with plastic sheets prior to loading to prevent oil leakage.

Either a Uniform Hazardous Waste or a Non-Hazardous Waste Manifest shall be completed prior to the transportation of any waste materials. Appropriate forms can be provided by the waste transporter.

5.9.9 Waste Management Plan

Preparation of a Waste Management Plan which defines locations, procedures to be used, and contains other requirements will be required in most cases. Forms are provided in the SF Bay/Delta ACP to facilitate the preparation of a Waste management Plan. These forms include the Waste Management and Disposal Plan (for use in developing the initial WMP) and the Waste Management and Disposal Plan Update (for use in making changes in the original plan).

5.9.10 Documentation

Detailed documentation of all waste handling, treatment and transportation activities is essential. Documentation efforts should include:

- Preparation of sketches and photographs of all temporary handling / treatment / storage sites;
- Documentation of all permits and/or wavers;
- Retention of copies of all Uniform Hazardous Waste, Non-Hazardous Waste, or other manifests;
- Estimation and recording of volumes / quantities of materials received, treated, shipped, including estimates of truck / bin / bag volumes, percent oil, percent debris, percent water, etc.

- Development and implementation of a plan for random sampling and analysis may be necessary for adequate documentation of quantification of oil recovery and mass balance calculations.

6.0 RESPONSE RESOURCES

6.1 PRIMARY RESPONSE CONTRACTOR

6.1.1. Resources

NRC Environmental Services has been contracted as Wickland Pipelines primary Response Contractor. A description of NRC's resources include the following:

Resource Overview

As a result of over 20 years experience in providing planned and emergency environmental services to public and private sector clients, NRC Environmental Services Inc (NRCES) has developed a diverse and extensive network of equipment and material resources throughout the western United States. This includes a company-wide database of subcontractors, equipment shops, and material vendors located across our service areas, as well as a significant inventory of company-owned equipment and specialty items at the various field service centers. The net result is a West Coast-wide system which enables us to provide a virtually unlimited pool of equipment and material resources in support of response activities.

The NRCES equipment resource network, as described above, consists of:

- NRCES owned transportation units, marine spill response equipment, heavy equipment (construction), light equipment, material handling equipment, specialty tools, and monitoring instruments
- Subcontracted support equipment and materials
- An extensive network of local equipment dealers and materials supply companies
- A region-wide network of subcontractors for analytical, transportation, and disposal services

Included herein is an equipment summary table presenting company owned equipment available from our Alameda, CA service center.

For brevity purposes NRCES has only included the Alameda service center equipment list. If requested, NRCES would be happy to provide a complete list of equipment, tool and material capabilities for each of the six California responding offices.

Northern California
Bay Area Service Center

Equipment	Quantity	Location
Communication Equipment		
Cell Phones	84	Alameda
Digital Cameras	20	Alameda
Pagers	15	Alameda
Radios	31	Alameda
Environmental Services Equipment		
Blowers	20	Alameda
Compressors	15	Alameda
Confined Space Entry	8	Alameda
Decon Pools	10	Alameda
Generators	15	Alameda
Hoses, Chemical (1"-2")	1,000' +	Alameda
Hoses, Petroleum (2"-4")	3,000' +	Alameda
Hoses, Water (2"-4")	1,800' +	Alameda
Ladders/Lifts	15	Alameda
Light Stands/Towers	16	Alameda
Power Tools (saws, jackhammers, roto hammers, chipping guns)	18	Alameda
High Pressure Washers, 3-5K psi	15	Alameda
Hydroblaster, 10-20K psi	1	Alameda
Pumps (diaphragm, submersible, trash)	35	Alameda
Pumps (drum head)	5	Alameda
Vacuums (hepa, Hg, negative air)	6	Alameda
Welding/Torch Set	3	Alameda
Heavy/Material Handling Equipment		
Backhoe w/Attachments	2	Alameda
Skidsteer w/Attachments	2	Alameda
Crane Trucks	3	Alameda
Dump Truck , Tracked	1	Alameda
Dump Truck (10-14cy)	2	Alameda
Dump Trailer (6 cy)	2	Alameda
Forklift	6	Alameda
Guzzler	2	Alameda
Vactor/ Jetter	3	Alameda

Land Hazmat Response		
All Terrain Vehicles	5	Alameda
Equipment Trailers	4	Alameda
ER Vans	2	Alameda
ER Trailers (up to 24')	18	Alameda
ER Trailers (up to 48')	15	Alameda
Incident Command Trailer	1	Alameda
Office Trailer	1	Alameda
Truck Rollover Kit	4	Alameda
Wildlife Trailer	1	Alameda
Marine Emergency Response		
Containment Boom (8" x 12" x 100')	72,500'	Alameda
ER Trailer-Marine Supplies	1	Alameda
MTR Trailer	3	Alameda
Response Vessel (12-14')	12	Alameda
Response Vessel (16-20')	5	Alameda
Response Vessel (21-40')	15	Alameda
Skiffs w/outboard	9	Alameda
Skimming Vessels	3	Alameda
Skimmers	30	Alameda
Safety Equipment		
CSE Rescue (Tripod, Harness, Lanyard)	10	Alameda
Air Monitoring	12	Alameda
Air Sampling	6	Alameda
HazCat Kit	3	Alameda
Mercury Meter	1	Alameda
Radiation Meter	1	Alameda
Traffic Control Set Ups	10	Alameda
Transportation Equipment		
Box Van Trucks, 20-28'L	4	Alameda
Box Van Truck &Trailers, 30-48'	18	Alameda
Flat Bed Truck & Trailer, 30-48'	7	Alameda
Gear Trucks, 2-5 ton	14	Alameda
Pick-Up Trucks, ¾-1 ton	32	Alameda
Roll-Off Bin Trucks	7	Alameda
Roll-Off Bins	50	Alameda
Vacuum Trucks, 120 bbl	15	Alameda
Vacuum Trucks, 70 bbl	5	Alameda

6.1.2 Resource Assessment

- NRC is located in Alameda, CA, approximately 80 miles from the SMF Pipeline Metering Station and approximately 35 miles from the SJC Pipeline Pump and Launcher stations. Depending on traffic conditions, a driving time of several

hours can be expected to SMF and our hour to SJC. NRC is not anticipated to have problems meeting Tier 1, 2 or 3 response time planning requirements for the projected WCD (12hr, 36hr, 60hr for "all other areas", respectively). Response to other portions of the pipeline may require slightly longer driving times.

- NRC has capabilities far exceeding WCD requirements for recovery and storage.

6.2 EQUIPMENT MAINTENANCE AND INSPECTION

Wickland will ensure that all equipment operated by its primary response contractor is properly maintained. This will be done through inspection of the periodic maintenance and inspection records maintained by NRC.

6.3 RESPONSE CONTRACT

The Wickland and NRC response contract is as follows:

Primary Emergency Response Agreement

EMERGENCY RESPONSE AND SERVICE AGREEMENT

Between

NRC ENVIRONMENTAL SERVICES INC.

And

WICKLAND PIPELINES, LLC

INDEX

EMERGENCY RESPONSE AND SERVICE AGREEMENT

THIS AGREEMENT, effective this 1st day of June, 2005 by and between NRC ENVIRONMENTAL SERVICES INC. duly organized and existing by virtue of the laws of the State of Washington (herein referred to as "NRCES"), and Wickland, duly organized and existing by virtue of the laws of the State of California (herein referred to as "CUSTOMER").

WHEREAS, NRCES is engaged in the business of providing environmental and hazardous waste management services. This includes emergency response services to mitigate oil, hazardous and other substances released into the environment.

WHEREAS, CUSTOMER desires to engage NRCES to perform emergency response and other environmental services on an as-needed basis.

NOW, THEREFORE, for valuable consideration, the parties agree as follows:

ARTICLE I. SCOPE OF SERVICES

1.1 NRCES will provide emergency response services ("Response Services") to respond to spills of oil of any kind or in any form (including petroleum, fuel oil, sludge, oil refuse, and oil mixed with wastes other than dredged spoil), hazardous waste, or other regulated and non-regulated substances or materials as defined by applicable state and federal law (referred to collectively as "Waste") by CUSTOMER on land or in the water on an as-called, as-able basis in the locations described on EXHIBIT "A" to this Agreement. The scope of Response Services to be performed by NRCES shall be determined by the parties at the time NRCES accepts CUSTOMER's request for Response Services (as further defined in Article 2), and as directed by CUSTOMER's on-scene representative and any governmental agency involved.

1.2 NRCES (either through its own organization or through subcontractors) may provide CUSTOMER with additional environmental services on a planned basis ("Planned Services", and collectively with Response Services, referred to as "Services"), including but not limited to soil and groundwater remediation, facility decontamination, demolition, industrial cleaning and vacuuming, transportation, preparedness training, and other environmental services pursuant to requests by Customer and proposals submitted by NRCES. Once accepted by CUSTOMER, NRCES' proposal for Planned Services shall govern the performance and compensation of the Planned Services, subject to the terms and conditions of this Agreement.

ARTICLE 2. INITIATION OF RESPONSE SERVICES

2.1 CUSTOMER shall request Response Services by telephone during any 24-hour period at **1-800-33-SPILL (1-800-337-7455).**

2.2 CUSTOMER shall provide NRCES with the location of the spill ("Site"), nature of the emergency, approximate time of the emergency, substance released, chemical name, trade name, amount released, name of CUSTOMER's on-scene representative, and other information requested by NRCES. NRCES shall be entitled to rely upon this information in determining if and to what extent NRCES will respond.

2.3 Unless otherwise stated by a Retainer Addendum executed by both parties, NRCES is not obligated to respond to requests for Response Services. If NRCES is able to respond, NRCES does not thereby guarantee any response time. CUSTOMER acknowledges that NRCES may determine in its sole discretion which requests for emergency response to respond to in the event that NRCES at any time receives more requests than it can respond to with its available personnel and equipment. CUSTOMER further acknowledges that this Agreement does not obligate NRCES to remove personnel and equipment from response services initiated prior to CUSTOMER's initiation of the Response Services.

2.4 CUSTOMER may issue written confirmation of a request for Response Services. This shall not, however, be a condition precedent to payment for Response Services performed by NRCES under this Agreement. Any terms on such written confirmation that vary from the terms of this Agreement are hereby rejected unless specifically accepted by NRCES in writing.

2.5 During the term of this Agreement only, including all renewal periods, CUSTOMER may name NRCES in its state and federal contingency plans only as a supplemental resource, without any guarantee of response time or resource level capabilities. NRCES shall be entitled, without liability to CUSTOMER, to provide to any governmental agency at any time notice of the status of CUSTOMER's relationship with NRCES, including, without limitation, the right upon termination of this Agreement, to notify any governmental agency that this Agreement has been terminated and that CUSTOMER is not entitled to continue to name NRCES in its contingency plans.

ARTICLE 3. NRCES' RESPONSIBILITIES

3.1 NRCES will provide supervision, labor, materials, tools, equipment and subcontracted items for the performance and completion of the Services, to the extent agreed between the parties. NRCES shall act as an independent contractor in the performance of the Services.

3.1.1 NRCES shall supervise, direct, control and directly pay for all personnel NRCES provides to perform the Services, whether they are permanent or temporary personnel of NRCES, or employees of third parties who provide personnel to NRCES on a contract basis. Similarly, all equipment utilized by NRCES, whether owned, rented or under subcontract, including but not limited to all vessels, boom, and skimmers, shall be installed, operated, monitored, maintained, demobilized and decontaminated by NRCES personnel or the personnel of NRCES' subcontractors. Such equipment and the labor hours associated with installing, operating, monitoring, maintaining, demobilizing and decontaminating the equipment, are part of the Services to be compensated in accordance with Article 5. NRCES shall not be required to supervise, direct or control any personnel provided by CUSTOMER or temporary personnel hired by CUSTOMER to perform other services.

3.2 CUSTOMER recognizes that Response Services provided by NRCES under this Agreement are provided on an emergency basis, that the purpose of each response is to minimize to the extent practicable the environmental damage and health and safety risks resulting from spills or releases of oil, hazardous or other substances; and that the substance involved may not be eliminated from the Site by the emergency response. NRCES DOES NOT WARRANT, BY THE TERMS OF THIS AGREEMENT OR BY UNDERTAKING RESPONSE SERVICES PURSUANT TO THIS AGREEMENT, THAT SUCH RESPONSE SERVICES WILL RENDER THE SITE SAFE FOR ANY FORM OF HUMAN ACTIVITY OR IN COMPLIANCE WITH ANY STATE, LOCAL OR FEDERAL LAW.

3.3 NRCES shall take necessary precautions for the safety of its personnel and shall comply with applicable provisions of federal, state and local safety laws and regulations. While on CUSTOMER's facilities or vessels, NRCES shall comply with all instructions received from CUSTOMER concerning

safety policies and procedures. CUSTOMER shall give such instructions with as much advance notice as is practicable under the circumstances. NRCES shall maintain all required safety training, including HAZWOPER training, of its employees. NRCES shall not have responsibility for the elimination or abatement of safety hazards created or otherwise resulting from conditions at the Site existing prior to NRCES' presence, or arising from work at the Site carried on by CUSTOMER's other contractors, employees and agents. CUSTOMER agrees to cause any such contractors, employees and/or agents to abide by and fully adhere to all applicable provisions of federal, state and local safety laws and regulations and to comply with all reasonable requests of NRCES for the elimination or abatement of any safety hazard at the Site.

3.3.1 With respect to Response Services, CUSTOMER understands and agrees that (i) actions carried out in an emergency response may be inherently dangerous and difficult, (ii) rules and requirements that may be appropriate and applicable under normal circumstances may not be appropriate or applicable in a particular emergency situation, as recognized by the considerable authority of governmental or regulatory agencies to direct private actions in a response, and (iii) there are unresolved jurisdictional and applicability issues associated with emergency response that may make it difficult to determine the applicability of a particular requirement. Therefore, the provisions of Article 3.3 will not be interpreted in a manner that would hold NRCES to a standard that would be unreasonable under the actual conditions of particular spill event. All NRCES actions carried out consistently with the directions of the federal or state on scene coordinator or with approval of applicable safety officials will be deemed to be in compliance with Article 3.3.

3.4 NRCES will require laboratories hired by NRCES to maintain samples for thirty (30) calendar days from the date the analysis is performed. After thirty (30) days, at CUSTOMER's direction, such samples will be returned to CUSTOMER or such samples will be disposed of with CUSTOMER paying for all charges and expenses associated with such disposal.

ARTICLE 4. CUSTOMER'S RESPONSIBILITIES

4.1 Prior to the commencement of the Services, CUSTOMER shall designate to NRCES a representative who shall be fully acquainted with the Services, and who has authority on behalf of CUSTOMER to approve changes in the Services, approve daily reports submitted by NRCES setting forth the daily charges, resolve disputes in invoices, render decisions promptly, execute waste manifests and furnish information expeditiously and in time to meet the time schedule for completion of the Services.

4.2 CUSTOMER shall provide full and complete information regarding its requirements for the Services and shall immediately transmit to NRCES any new information which becomes available or any change in plans subsequent to any such providing of information. CUSTOMER shall communicate to NRCES those special hazard risks involved in the excavation and/or removal of the Wastes of which it is or becomes aware. Such information shall include, but not be limited to, any relevant notification of substantial risk given by CUSTOMER pursuant to the Toxic Substances Control Act.

4.2.1 CUSTOMER shall furnish to NRCES available information on the Site describing: physical characteristics, soil reports and subsurface investigations, the location of any installations and underground utilities, legal limitations, legal description, and other reports or documents that may be reasonably requested by NRCES. In the event the Site is not owned by CUSTOMER, CUSTOMER shall be responsible for obtaining any information relative to the Site from the owner and providing that information to NRCES.

4.3 CUSTOMER shall secure and pay for all necessary approvals, easements, assessments, permits and charges required for the Services to be performed. CUSTOMER shall secure all necessary approvals, judicial and/or administrative orders necessary to insure NRCES' legal access to the Site.

CUSTOMER warrants that any right-of-way provided by CUSTOMER to/from the Site and/or to/from the most convenient public way, is sufficient to bear the weight of all NRCES' equipment and vehicles reasonably required to perform the Services required. NRCES shall not be responsible for any changes required to be made to any private pavement or accompanying subsurface of any route for its performance of the Services. CUSTOMER shall be responsible for repairs to all roadways and rights-of-way arising out of the normal wear and tear resulting from NRCES' use thereof by its equipment during the performance of the Services.

4.4 Upon NRCES' written request, CUSTOMER shall furnish reasonable evidence satisfactory to NRCES that sufficient funds are available and committed for the entire cost of the Services. Unless such evidence is furnished, NRCES is not required to commence or continue any Services, or may, if such evidence is not presented within ten (10) days of the request, terminate this Agreement as set forth in Article 14. The failure of NRCES to request or insist upon the receipt of this evidence at any time shall not be a waiver of CUSTOMER's obligation to make payments pursuant to this Agreement, nor shall it be a waiver of NRCES' right to request or insist that such evidence be provided at a later date.

4.5 CUSTOMER warrants that it holds clear title to all Wastes to be handled by NRCES and is under no legal restraint or order which would prohibit the transfer of the Wastes to a disposal facility designated by CUSTOMER for treatment, storage and/or disposal. CUSTOMER shall execute all transportation, treatment and disposal manifests and other documentation as generator of the Wastes involved.

4.6 CUSTOMER warrants that the Services to be done under this Agreement does not violate any final court order or any final ruling of any governmental agency of which CUSTOMER has knowledge.

4.7 CUSTOMER shall pay all taxes, assessments, and fees associated with the Services, including taxes for which CUSTOMER claims it is exempt or for which CUSTOMER issues NRCES direct-pay permits, and generator, disposal and other fees. CUSTOMER shall reimburse NRCES for all sales taxes, use or similar taxes or assessments or fees paid by NRCES related to the Services hereunder.

4.8 CUSTOMER shall report any "confirmed release" to the appropriate local, state and federal agency in accordance with any applicable regulations. CUSTOMER shall indemnify, defend and hold harmless NRCES from any and all fines, penalties, assessments and costs resulting from any failure of CUSTOMER to report such release.

4.9 The services and information required by the above Sections 4.1 to 4.8 shall be furnished with reasonable promptness at CUSTOMER's expense and NRCES shall be entitled to rely upon the accuracy and the completeness thereof in the performance of the Services.

ARTICLE 5. COMPENSATION

5.1 Unless otherwise stated in a written proposal for Planned Services issued by NRCES, CUSTOMER shall pay NRCES for all Services performed on a time and materials basis in accordance with the terms and rates set forth in EXHIBIT "B", NRCES' Schedule of Rates, as amended from time to time. CUSTOMER shall pay for all personnel provided by NRCES in accordance with these rates, whether they are permanent or temporary employees of NRCES, or employees of third parties who provide personnel to NRCES on a contract basis. CUSTOMER expressly acknowledges and agrees that NRCES administrative personnel required to perform project specific record-keeping, reporting, accounting, logistics and resource allocation are required for the proper performance of the Services and shall be paid for at the rates set forth in EXHIBIT "B". Similarly, all equipment and materials provided by NRCES that are listed on EXHIBIT "B", whether rented or owned, shall be paid for at the rates contained therein. CUSTOMER shall also pay for all expenses incurred by NRCES in connection with the Services, including but not limited to expenses for travel (including local travel), meals, lodging, reproduction, deliveries,

equipment rental, freight, transportation, disposal and subcontractor charges, all in accordance with EXHIBIT "B". CUSTOMER acknowledges that all equipment rental, subcontractor charges, disposal services, material costs and other third party charges for services, personnel, materials or equipment not listed on EXHIBIT "B" will be invoiced by NRCES and paid for by CUSTOMER at the cost of such services, personnel, equipment or materials to NRCES, plus a markup of 20%.

5.1.1 The rates set forth in EXHIBIT "B" shall be firm from the date of execution until NRCES provides written notice of a rate change. NRCES reserves the right to modify such rates at any time, provided, however, that no such rate change will take effect until thirty (30) days after NRCES provides written notice of the rate change to CUSTOMER.

5.2 Unless specifically stated otherwise by NRCES in a written proposal for Planned Services, estimates of the cost of Services provided by NRCES are provided for budgetary purposes only, and shall not be deemed guaranteed maximum prices or otherwise limit the amount of compensation that NRCES shall receive for performance of the Services. This provision applies notwithstanding language to the contrary appearing on any purchase order or other written documentation provided to NRCES by CUSTOMER.

5.3 NRCES shall submit invoices setting forth the amounts due for all current charges and expenses on a monthly basis or upon completion of the Services, whichever occurs first. Unless a different address is provided by CUSTOMER, NRCES shall submit all invoices to the address shown on the signature page of this Agreement. All invoices will be due upon receipt, but no later than thirty (30) days from the date of the invoice. CUSTOMER shall send payment to NRCES at the following address:

NRC Environmental Services Inc.
Dept. 5251
P. O. Box 34936
Seattle, WA 98124-1936

5.3.1 CUSTOMER shall, within fifteen (15) days of receipt of invoice, communicate in writing to NRCES any invoice errors, discrepancies or disputes. If such communication is not made within this 15-day period, the invoice will be deemed to be approved and shall be paid. If an error, discrepancy or dispute is identified, then the parties will endeavor to resolve the dispute within fifteen (15) days. If no resolution is made within this time frame, the disputed amount will be excluded from the total invoice amount, with the parties endeavoring to resolve the dispute within thirty (30) days. The balance of the invoice shall be deemed approved and shall be paid within thirty (30) days after the original invoice date.

5.3.2 Balances outstanding more than thirty (30) days after the invoice date shall be deemed delinquent and shall earn interest at the rate of 1.5 % per month, or the maximum rate permitted by law (whichever is lesser), from the due date until paid. In addition to interest, CUSTOMER shall be responsible for all costs incurred by NRCES to collect overdue amounts, including collection fees, filing fees, court costs and attorney's fees. NRCES reserves all legal rights and recourses against CUSTOMER and its property for failure of CUSTOMER to pay such invoices when due. Further, NRCES shall have the right to suspend performance of the Services in the event any invoice is delinquent, and to continue such suspension until all delinquent invoices are paid. CUSTOMER shall pay for all costs incurred by NRCES during, and arising as a result of the suspension period in accordance with EXHIBIT "B".

5.4 For one year from the completion of each request for Services, NRCES will maintain records of all labor, materials, equipment and expenses invoiced to CUSTOMER on a rate sheet or reimbursable basis and will make such records available to CUSTOMER during normal business hours at the NRCES office providing the Services, or by mail if so requested.

ARTICLE 6. CHANGES IN THE SERVICES

6.1 Without invalidating this Agreement, CUSTOMER and NRCES may request changes in the Services within the general scope of the Services. In the event changes in the Services, emergencies, changed conditions, or delays and interferences result in increased work requirements, extended schedule or increased cost to perform the Services, CUSTOMER shall pay NRCES for such changed or increased Services or delays in accordance with EXHIBIT "B" unless otherwise mutually agreed by the parties in writing.

6.2 CUSTOMER acknowledges that Response Services may be governed and regulated by certain state, federal and local laws and the regulations and other requirements of various government agencies with jurisdiction over emergency events and other environmental matters. To the extent any of these governmental requirements increase the scope of Response Services to be rendered and the expenses associated with such Response Services, CUSTOMER shall pay NRCES for all Response Services and expenses in accordance with Article 5.

ARTICLE 7. INSURANCE

7.1 NRCES shall carry at its expense, during the term of this Agreement, the insurance coverages set forth below:

COVERAGE	LIMITS
(a) Worker's Compensation	Statutory
(b) Employer's Liability	$1,000,000 each occurrence
(c) Commercial General Liability (Bodily Injury & Property Damage)	$1,000,000 combined single limit/aggregate
(d) Automobile Liability (Bodily Injury & Property Damage)	$1,000,000 combined single limit/aggregate
(e) Contractor's Pollution Liability	$1,000,000 per claim

NRCES agrees to furnish to CUSTOMER, upon CUSTOMER's request, insurance certificate(s) evidencing such coverages. If requested, CUSTOMER will be named an additional insured on the General Liability policy, but only to the extent of negligent operations performed by NRCES. The providing of insurance and the granting of additional insured status shall not be construed as an assumption of any liability by NRCES for the acts, omissions, negligence or other liability caused by CUSTOMER or any third party. CUSTOMER shall be responsible for purchasing and maintaining its own liability insurance.

7.2 CUSTOMER and NRCES waive all rights against each other for damages covered by property insurance during and after completion of the Services, except in the case of gross negligence or willful misconduct of the other party.

ARTICLE 8. INDEMNIFICATION

8.1 Subject to section 8.1.1 below, CUSTOMER's indemnification obligations and Articles 14 and 15, NRCES agrees to indemnify, defend and save harmless CUSTOMER from and against liabilities, claims, demands, damages, causes of action, costs and expenses, including reasonable attorney's fees and costs of defense (collectively referred to as "Claims") for bodily injury to or death of any person or destruction of or damage to any property of any third party, but only to the extent arising from (i) the negligent and gross negligent acts or omissions or willful misconduct of NRCES, its agents, employees or subcontractors in the performance of the Services, and/or (ii) the failure of NRCES or any of its agents, employees or subcontractors to observe or comply with any of NRCES' duties and obligations as a response contractor under the law or this Agreement. This indemnification does not extend to Claims arising from (a) CUSTOMER's failure to comply with and fulfill its obligations under the law or this Agreement, (b) negligent or gross negligent acts or omissions or willful misconduct of CUSTOMER, any one under contract with CUSTOMER or otherwise under CUSTOMER's direction and control, or (c) acts or omissions of any third party. NRCES' liability under this Section shall not exceed the insurance limits specified in Article 7.

8.1.1 Notwithstanding any other provision contained in this Agreement, NRCES' obligation to indemnify CUSTOMER shall not extend to any Claims that NRCES would otherwise be protected against, exempt from or liability limited under any federal or state laws protecting response contractors from certain liability in connection with their response efforts, even if such Claims arise from negligent acts or omissions of NRCES. It is agreed that NRCES' liability under section 8.1 will not in any case exceed NRCES' liability under such laws.

8.2 CUSTOMER shall indemnify, defend and hold harmless NRCES, its parent and affiliated companies, their directors, officers, employees, agents, insurers and subcontractors against Claims to the extent arising out of or as a result of (i) the negligent acts or omissions or willful misconduct of CUSTOMER, its employees, representatives, agents and other contractors; and/or (ii) the failure of CUSTOMER or any of its employees, agents or other contractors to observe or comply with any of CUSTOMER's duties and obligations under the law or this Agreement.

8.3 CUSTOMER shall indemnify, defend and hold harmless NRCES, its parent and affiliated companies, their directors, officers, employees, agents and subcontractors against any and all Claims arising out of or as a result of (i) the presence of NRCES or its subcontractors on the Site if the Site is not owned by CUSTOMER; and/or; (ii) the discharge, escape or release of Waste from CUSTOMER's property or the property of others, except to the limited extent caused by the active negligence, gross negligence or willful misconduct of NRCES in the performance of the Services, provided that this exception shall not apply to the extent NRCES is immune or NRCES' liability is limited under federal or state laws.

ARTICLE 9. CONFIDENTIALITY

9.1 For purposes of this Article, "Information" means any verbal, handwritten, typewritten, printed, recorded or graphic matter (including computer-generated mediums) containing proprietary business information of either party which may come within the knowledge of the other party in the performance of this Agreement. "Confidential Information" is any Information that has been designated in writing by the party seeking to impose any obligation hereunder as "Confidential". In the case of verbal or visual Information, the party seeking to apply this Article to such Information shall, within three (3) days of the conveyance of the Information to the other party, notify the other party of that the Information is considered Confidential Information and to be treated as such under this Article.

9.2 NRCES and CUSTOMER (including both parties' employees, officers, agents, and directors) shall treat Confidential Information as confidential and proprietary and not disclose it to others during or for a period of three (3) years after the completion of any Services performed under to this Agreement (except as

is necessary to perform Services under this Agreement), without securing the prior written consent of the other party.

9.3 Nothing contained within this Article shall prevent either NRCES or CUSTOMER from disclosing to others or using in any manner information which either party can show:

a. has been published and has become part of the public domain other than by acts, omissions, or fault of NRCES or CUSTOMER;

b. has been furnished or made known to NRCES or CUSTOMER by third parties (other than those acting directly or indirectly for or on behalf of NRCES or CUSTOMER) as a matter of legal right without restrictions on its disclosure; or,

c. was in either party's possession prior to the disclosure thereof by CUSTOMER or NRCES to the other.

9.4 If either party shall be required by subpoena, court, or administrative order (hereinafter "the Order") to disclose any Confidential Information of the other party, the disclosing party shall give immediate notice to the other party. Upon receipt, the party whose information may be the subject of the Order may interpose all objections it may have to the disclosure of its Confidential Information at its cost. If the party owning the Confidential Information fails to make timely objections to the disclosure of such Confidential Information, the party who received the Order shall comply with the Order without liability to the other party.

ARTICLE 10. EXCUSE OF PERFORMANCE

10.1 The performance of this Agreement, except for the payment of money for services already rendered, may be suspended by either party in the event performance of this Agreement is prevented by a cause or causes beyond the reasonable control of either party. Such causes shall include, but not be limited to: acts of God; acts of war; acts of terrorism; riot; fire; explosion; accident; flood; abnormal weather; sabotage; lack of adequate fuel, power, raw materials, labor, transportation or disposal facilities; requirements of Governmental laws, regulations, permits, ordinances, rules, orders or actions; breakage or failure of machinery or apparatus; national defense requirements; injunctions or restraining orders; failure or refusal of disposal facilities to handle or receive Wastes; and labor trouble, strike, lockout or injunction (provided that neither party shall be required to settle a labor dispute against its own best judgment).

10.2 The party asserting a right to suspend performance under this Article must, within a reasonable time after it has knowledge of the effective cause, notify the other party of the cause for suspension, the performance suspended, and the anticipated duration of suspension.

10.3 Upon receipt of notice as set forth in 10.2, advising the other party of a suspension of performance, the parties shall mutually agree on one of the following:

a. termination of all or any part of the Services affected;

b. demobilization of affected personnel and equipment from the Site with remobilization to the Site occurring at a mutually agreeable time after the end of the suspending event; or,

c. placement of affected personnel and equipment in a standby mode until the end of the suspending event.

If the parties agree to option a. above, CUSTOMER shall compensate NRCES, unless otherwise agreed to, as set forth in Section 12.3. If the parties agree to either option b. or c. above, the parties shall agree to schedule adjustments and adjustment to compensation in the manner as set forth in Articles 5 and 6.

ARTICLE 11. DIFFERING SITE CONDITIONS

11.1 NRCES shall be entitled to equitable adjustments in the compensation and schedule in the event it encounters physical, structural, subsurface, soil or other conditions at the Site differing from those indicated, provided to or represented to NRCES. Thereafter, the parties shall agree in writing upon an appropriate amendment to this Agreement to reflect the cost and schedule impact of such conditions. NRCES shall not be required to continue performance of the Services upon notification to CUSTOMER of such differing site conditions until the appropriate amendment is agreed upon.

11.2 Absent mutual agreement to the contrary, NRCES shall be entitled to compensation for Services rendered as a result of changed conditions in accordance with EXHIBIT “B”.

ARTICLE 12. TERMINATION

12.1 This Agreement, or Services being performed under this Agreement, may be terminated with or without cause by either party upon thirty (30) days written notice to the other party.

12.2 This Agreement, or Services being performed under this Agreement, may be terminated by either party upon forty-eight (48) hours written notice should the other party fail substantially to perform its obligations under this Agreement through no fault of the party initiating the termination, provided the party initiating the termination has given the other party written notice of the deficiency, and allowed that party a reasonable period of time, not to exceed five (5) working days, to commence to cure the deficiency before notice of termination is issued.

12.3 In the event of termination not the fault of NRCES, CUSTOMER shall compensate NRCES for all Services performed prior to termination in accordance with the compensation for such Services as well as charges for demobilization, decontamination and other termination charges in accordance with EXHIBIT “B”.

ARTICLE 13. DELEGATION AND ASSIGNMENT

13.1 NRCES may at any time, without the prior consent of CUSTOMER, delegate, orally or in writing, the performance of a portion of the Services. However, any delegation by NRCES shall not operate to relieve NRCES of its responsibilities hereunder.

13.2 Neither party may assign any rights or remedies hereunder without the prior written consent of the other party.

ARTICLE 14. HANDLING OF SUBSTANCES

14.1 In the performance of this Agreement, NRCES my handle Waste that pre-existed NRCES’ presence at the Site. CUSTOMER acknowledges that CUSTOMER has exclusive title to all Waste the subject of this Agreement and is responsible for any real or personal property contaminated with or otherwise affected by such Waste. Nothing contained within this Agreement nor the performance of any Services by NRCES shall be construed or interpreted as requiring NRCES to assume the status or liability as an owner, operator, manager or person in charge of all or any portion of the Site, as arranger for the treatment,

transportation or disposal of any Waste, or as owner or generator of any Waste under the Resource Conservation and Recovery Act, 42 USCA, Section 6901. et seq., as amended, (hereinafter "RCRA"), Comprehensive Environmental Response Compensation and Liability Act, 42 USCA, Section 9601. et seq., as amended (hereinafter "CERCLA"), or within any other federal or state statute governing the treatment, storage and disposal of Waste (herein collectively referred to as "Regulations"). NRCES has not taken and will not take title, control of or otherwise own any Waste under this Agreement.

14.2 CUSTOMER shall retain the primary responsibility for compliance with the provisions of such Regulations governing the treatment, storage and disposal of Waste. NRCES will transport or cause to be transported any Waste under this Agreement to a disposal or treatment facility selected by CUSTOMER. Any such transportation undertaken under this Agreement shall be undertaken or arranged solely as CUSTOMER's agent and under CUSTOMER's direction.

14.3 CUSTOMER shall provide NRCES with CUSTOMER's EPA identification number and any other identification or authorization required by law and assigned to CUSTOMER.

14.4 If CUSTOMER requests NRCES' assistance, then NRCES, as requested and directed by CUSTOMER, may perform the following Services:

a. obtain analytical testing to assist CUSTOMER in the proper characterization of the Waste for manifest preparation;

b. identify potential transporters and disposal facilities which may be used in the transportation and disposal of Wastes collected;

c. enter into subcontract or purchase order arrangements with transporters and/or disposal facilities selected by CUSTOMER on behalf of CUSTOMER; and,

d. prepare manifests for CUSTOMER's approval and execution.

14.5 NRCES shall not be liable to CUSTOMER (or any person claiming through CUSTOMER) in any amount for any personal injury, illness, death or property damage caused in whole or in part by Waste that is handled by NRCES in the performance of this Agreement, except to the extent caused by the active negligence or willful misconduct of NRCES.

14.6 NRCES shall have no liability to CUSTOMER (or any person claiming through CUSTOMER) for contamination or change in character or properties of any Waste that is off-loaded by NRCES by pump, vacuum or otherwise into equipment supplied by CUSTOMER or NRCES for transportation by CUSTOMER, NRCES or a third party to a destination designated by CUSTOMER. CUSTOMER hereby releases NRCES from and indemnifies NRCES against any such liability or damages. Any increase in cleanup, transportation, treatment or disposal costs as a result in any such contamination or change in character or properties of the Waste shall be paid for by CUSTOMER at its sole expense.

ARTICLE 15. WARRANTIES AND LIMITS OF LIABILITY

15.1 NRCES warrants that its provision of the Services under this Agreement will conform to the standards of care, skill and diligence normally observed by contractors performing similar services. THIS WARRANTY IS IN LIEU OF, AND EXCLUDES ALL OTHER WARRANTIES, STANDARDS AND GUARANTEES, WHETHER EXPRESSED OR IMPLIED, ARISING BY OPERATION OF LAW OR OTHERWISE, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY OF ANY EQUIPMENT, MACHINERY, PROCESS OR

SYSTEM EMPLOYED OR PROVIDED BY NRCES. CUSTOMER'S SOLE REMEDY AND NRCES' SOLE LIABILITY FOR BREACH OF WARRANTY SET FORTH IN THIS AGREEMENT OR OTHERWISE SHALL BE THE PERFORMANCE OF THE SERVICES IN QUESTION TO THE EXTENT NECESSARY TO CURE THE BREACH. Such remedy shall be available to CUSTOMER only if CUSTOMER reports the breach to NRCES within a reasonable period of time after discovery of the breach and in any event prior to completion and demobilization of Response Services, or not later than one (1) year after completion of Planned Service in question. In no event will NRCES' obligation to reperform Services exceed the compensation actually paid to NRCES for the performance of the Services in question, less those amounts paid by NRCES to third parties.

15.2 To the fullest extent allowed by law, NRCES, its parent and affiliated companies, their directors, officers, employees, agents and subcontractors, shall not be liable to CUSTOMER, and CUSTOMER hereby releases them from special, indirect, incidental, consequential or exemplary damages in any way related to or in connection with the Services, this Agreement or their presence at the Site, regardless of the cause, including negligence, gross negligence, willful misconduct or strict liability.

ARTICLE 16. ADDITIONAL GENERAL PROVISIONS

16.1 Waiver - Any waiver by either party of any provision or condition of this Agreement shall not be construed or deemed to be a waiver of any other provision or condition of this Agreement, nor a waiver of a subsequent breach of the same provision or condition, unless such waiver be so expressed in writing and signed by the party to be bound.

16.2 Governing Law - The validity and interpretation this Agreement shall be governed and construed in accordance with the laws of the State of Washington. Any suit, action or proceeding brought by either party in consequence of or to enforce any term or provision of this Agreement shall be commenced in the United States District Court for the Western District of Washington at Seattle, Washington, if such court has jurisdiction. In the event that the said United District Court lacks jurisdiction, then any suit, action or proceeding brought by either party shall be commenced in the King County Superior Court of the State of Washington. Customer submits to the jurisdiction of the courts of the State of Washington and the United States District Court for the Western District of Washington and consents to service of process by certified mail, return receipt requested, addressed in accordance with the address specified on the signature page hereof. The prevailing party in any such suit, action or proceeding shall be entitled to recover its costs of suit and reasonable attorney's fees.

16.3 Severability - If any article, subarticle, sentence or clause of this Agreement shall be adjudged illegal, invalid or unenforceable, this shall not affect the legality, validity or enforceability of this Agreement as a whole or of any other part of this Agreement not so adjudged.

16.4 Successors and Assigns - The covenants and agreements contained in this Agreement shall apply to, inure to the benefit of and be binding upon the parties hereto and upon their respective successors and permitted assigns.

16.5 Notice - Any notice to be given hereunder shall be in writing and deemed to have been sufficiently given when sent by confirmed facsimile transmission, courier service, delivered in person or by registered or certified mail, postage prepaid, return receipt requested, to the address of the respective party shown on the signature page. Either party may, by notice to the other, change the addresses and names identified below.

16.6 Applicability: All limitations of and releases from liability, and exclusive remedy provisions and entitlement to indemnity applicable to NRCES by law or under this Agreement shall apply to NRCES, Foss

Maritime Company, Saltchuk Resources, Inc., affiliates and subsidiaries of either, their officers, directors, employees, insurers and agents, and to any vessel owned or chartered by any of the above, and the master and crew of any such vessel.

16.7 Entire Agreement - This Agreement documents consist of: (i) this Agreement and its Exhibits; (ii) CUSTOMER accepted NRCES Proposals ;(iii) and amendments approved by the parties in writing after the execution of the Agreement. This Agreement represents the entire understanding and agreement between the parties hereto and supersedes any and all prior agreements, whether written or oral, that may exist between the parties. All Exhibits are by this reference incorporated into this Agreement.

16.8 Amendments - This Agreement may be amended or modified only by a written amendment to the Agreement signed by both parties. Additional or different terms on a Purchase Order, or other document provided by CUSTOMER shall be deemed material and shall be rejected, unless expressly accepted by NRCES in writing.

16.9 Term of Agreement - This Agreement, effective as of the date referenced on Page 1, is effective until either party notifies the other of its intention to terminate the Agreement with thirty (30) days prior written notice. This termination shall not apply to ongoing work until such work is completed.

16.10 Authority – Each party represents and warrants that the person signing this Agreement on its behalf is duly authorized and has the requisite corporate authority to bind such party to the terms and conditions of this Agreement. Each party is entitled to rely upon this representation as respects the authority of the person signing this Agreement on behalf of the other party. This Agreement can be signed in multiple counterparts. A facsimile of a signature or other electronically transmitted signature has the same force and effect as an original signature.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their duly authorized representatives as of the day and year as referenced on Page 1.

NRC ENVIRONMENTAL SERVICES INC.

Name: Stephanie Barton

Signature: Stephanie Barton

Title: Director, Emergency Response Programs

Address: 20500 Richmond Beach Drive NW
Seattle, WA 98177

Attn: Stephanie Barton

Phone: 206-546-7162

Fax: 206-546-7170

E-mail: sbarton@nrces.com

CUSTOMER

WICKLAND PIPELINES, LLC

Name: Roy Wickland

Signature: Roy Wickland

Title: Manager

Address: P.O. Box 13648
Sacramento, CA 95853

Attn: Roy Wickland

Phone: 916-978-2450

Fax: 916-978-2410

E-mail: rwickland@wickland.com

[redacted]

EXHIBIT "A"

TYPE OF OPERATION AND COVERAGE AREA
FOR SERVICES

1. Description of Services: (scope of work, overview of contract details, etc.)

Services include mainly Emergency Repsonse services for Wickland Pipelines Operations at both the Sacramento International Airport as well as the San Jose International Airport. Combined, these 13 miles of pipelines carry solely jet fuel to/from the airport and their respective pump stations, tank farms, etc.

2. Type of Operation: CUSTOMER's facilities and operations that may require Services under this Agreement are:

SMF Pipeline – The approximately 11 mile SMF Pipeline and related meter station serves the Sacramento International Airport. The 12" pipeline, commissioned in 2005, currently ships only Jet Fuel and normally operates 6 to 12 hours during one day per week.

SJC Pipeline - The approximately 2 mile SJC Pipeline and related pump and launcher station and receiver station serves the San Jose International Airport. The 8" pipeline, commissioned in 2010, ships only Jet Fuel and normally operates 4 to 6 hours during three to five day per week.

3. Coverage Area: The coverage areas requiring Response Services are:

SMF Pipeline – The SMF Pipeline is located in western unincorporated Sacramento County, eastern unincorporated Yolo County, and in the northwestern portion of the City of West Sacramento. The majority of the pipeline corridor is located within agricultural lands, while the metering station is located within a developed area of West Sacramento. The pipeline crosses several railroads, Interstate 5, the Sacramento River, and the Sacramento Bypass.

SJC Pipeline – The SJC Pipeline is located in an industrial and commercial area of the City of San Jose, connecting an existing Kinder Morgan Energy Partners petroleum products storage terminal to a new jet fuel tank farm at the San Jose International Airport. The pipeline crosses a railroad spur, a light rail line, several roadways, and the Guadalupe River.

Rev. 5-2010

7.0 LIST OF CONTACTS

7.1 Spill Reporting

Immediate reports (required by law):

- **California Office of Emergency Services (OES)**: (**800) 852-7550**

  OSPR: (916) 445-0411

  In addition,

- **National Response Center (NRC): (800) 424-8802**

Other immediate reports:

- Local Emergency Services: 911

7.2 Emergency Medical Services

- Yolo County EMS (916) 625-1701
  3856 Taylor Road, Suite G
  Loomis, CA 95650

- Santa Clara County EMS (408) 885-4250
  976 Lenzen Ave, Suite 1200
  San Jose, CA 95126

- UC Davis Medical Cente***r*** (916) 734-2011
  2315 Stockton Blvd.
  Sacramento, CA

7.3 Qualified Individuals

Wickland's Qualified Individuals include:

- Myles Butler
  Day: (916) 710-0287
  After Hours: (707) 224-3682
- Roy Wickland
  Day: (916) 978-2450
  After hours: (916) 425-3585
- Matt Wickland
  Day: (916) 978-2480

After Hours: (510) 258-2662

- Rick Carpenedo
  Day (408) 894-9151
  After Hours (408) 759-2290
- Dan Hall
  Day: (916) 978-2460
  After hours: (916) 813-1917

7.4 Spill Management Team

The Spill Management Team is staffed on a rotational basis. The current staffing roster is maintained at Wickland Pipelines office (916) 978-2400

7.5 Primary Responder

- NRCES: 24 hr. Emergency Number: 1-800-337-7455

7.6 Additional Oil Spill Cleanup Contractors

- Clean Bay Inc.
  2070 Commerce Ave.
  Concord, CA 94520
  (925) 685-2800

- Ecology Control Industries
  255 Parr Blvd.
  Richmond, CA 94801
  (800) 788-1393 (vac trucks 8 – 38 to 130 bbl)

- Phillip West Industrial Services
  395 W. channel Rd.
  Benicia, CA 94510
  (707) 746-8287 (vac trucks 18 - 35 to 120 bbl)

- Ponder Environmental Services
  125 Grobric Court
  Fairfield, CA
  (707) 748-7775 (vac trucks 5 - 35 to 120 bbl)

7.7 Waste Handling Contractors

- Alkire Fleet Lube Service
  Sacramento
  (916) 485-9870
- BOR Industries
  West Sacramento

(916) 372-2342

- JWA Oil Co.
  Benicia
  (650) 481-2288
- Ramos Oil Recyclers
  West Sacramento
  (916) 371-2570

7.8 Ecological Consultants (SCAT, NRDA, Etc.)

- Polaris Applied Sciences (206) 842-2951

7.9 Analytical Laboratories (organic chemistry capable)

- Analytical Associates
  4011 Power Inn Road, Suite G
  Sacramento, Ca 95826
  (916) 451-5034

- Ensco – California Analytical Lab #E 771
  2544 Industrial Blvd.
  West Sacramento, CA 95691
  (916) 374-4300

- Eureka Inc. #1165
  6790 Florin Perkins Rd
  Sacramento, CA 95828
  (916) 381-7953

- Morse Inc. #E 728
  1525 Fulton Ave.
  Sacramento, CA 95825
  (916) 481-3141

- Western Environmental Sci &Tech Stationary #1346
  1046 Olive Drive, Suite 3
  Davis, CA 95616
  (530) 753-9500

7.10 Other State Contacts

- Office of Emergency Services
  (916) 262-1621

- State Fire Marshall
  Pipeline Safety Division

(916) 445-8477

- CA Highway Patrol
  Hazardous materials Section
  (916) 445-2211

- Department of Toxic Substances Control
  (916) 323-3647
  24 hr 1 800 825-7550

- California EPA
  24 hour (800) 69 TOXIC
  (800) 952-5400 (water pollution)
  (800) 852-7550 (Hazmat)

- California Water Quality Control Board, Central Valley Region
  (916) 255-3000

- CA OSHA (916) 445-8200

- San Jose Sheriff's Department
  201 W Mission Street
  San Jose, CA 95110
  911
  (408) 277-8911 (emergency from cell phone)

- West Sacramento Fire Department
  1751 Cebrian St.
  West Sacramento 95691
  (916) 373-5842 24 hr

- Yolo Sheriff's Department
  PO Box 179
  Woodlands, Ca 95965
  (916) 666-8880

- West Sacramento Police Department
  PO Box 428
  West Sacramento, Ca 95605
  (916) 372-2461

- Sacramento County OES
  3284 Ramos Circle
  Sacramento, Ca 95827
  (916) 366-2911

- Yolo County Environmental Health
  911

7.11 Other Federal Agencies

- National Response Center

  (800) 424-8802 (24 hrs)

- Pipeline and Hazardous Materials Safety Administration (PHMSA)

  Western Region

  (720) 963-3160

- EPA Region IX

  (415) 777-3521 (24 hrs)

- USCG Pacific Strike Team

  (415) 883-3311 (24 hrs)

- NOAA (Scientific Support Coordinator)

  (310) 980-4107

8.0 TRAINING AND DRILLS

8.1 OVERVIEW

Wickland will conduct training and drill exercises as required under the provisions of OPA ’90. Wickland will also require that its Operator conduct training and drills in, or exceeding, conformance with OPA’90 and any applicable local requirements, and will monitor periodically for compliance. Wickland personnel may participate in emergency spill response management activities, and may participate in the Operators’ training program, or obtain ICS training elsewhere, at its option. Overall training and drills will typically include, but not be limited to the following:

- Risk Reduction Prevention Training for Wickland and Operator Personnel;
- HAZWOPER and First Aid training for Wickland and Operator personnel involved in emergency response activities;
- Provisions for ensuring adequate HAZWOPER training for personnel conducting emergency response activities under contract to Wickland or Operator;
- Training for Wickland and Operator response personnel in the content and use of the Wickland SIA OSCP; and
- Drills designed to exercise the entire contingency plan at least once every three years, including actual field exercises and agency participation.

Wickland’s training and drill program has been designed to address the provisions of OPA ‘90 and address Wickland's practical needs. It was developed to be consistent with guidance provided in the following documents:

- Training Reference for Oil Spill Response, U.S. Department of Transportation, U.S. Environmental Protection Agency, U.S. Department of the Interior, August, 1994.
- National Preparation for Response Exercise Program (PREP) Guidelines, U.S. Department of Transportation, U.S. Environmental Protection Agency, U.S. Department of the Interior, August, 1994.

The following section summarizes this program.

8.2 EMERGENCY RESPONSE TRAINING

8.2.1 Oil Pollution Prevention Training

Wickland views accident and pollution prevention training as an essential part of its safety and pollution control efforts. Wickland’s oil spill pollution prevention training is provided as part of its standard employee training program. This training is given to all new employees, and spill prevention briefings are repeated for facility operating personnel at least once a year. The spill prevention training includes, but is not limited to:

- Operation and maintenance of equipment;

- Applicable pollution control laws; and
- General overview of Wickland spill response procedures and capabilities.

This training is in addition to, but may be conducted concurrently with the oil spill response training described in the following sections.

8.2.2 Training for Wickland Qualified Individuals (QI)

Federal regulations require Wickland to identify the type of training the QI will receive. The goal is to ensure that the QI is fully capable to perform his or her duties. Although the QI is not expected to be a technical expert in clean-up technology, or pipeline repair, the QI must be familiar enough with the Wickland SIA Pipeline OSCP to know what measures must be taken under the circumstances. The QI must ensure adequate steps are taken to mitigate the situation and should know the capabilities of any response organization that is contracted to respond on behalf of Wickland and/or its Operator. The QI should be thoroughly familiar with procedures to activate and contract with Wickland's response organization.

The following list provides typical elements that Wickland will consider for incorporation into the training program for Qualified Individuals:

- Notification procedures and requirements for facility owners or operators; internal response organizations; federal and state agencies; and contracted response organizations and the information required for those organizations.
- Communication system used for the notifications.
- Information on the materials transferred, stored, or used by the facility, including familiarity with the material safety data sheets, special handling procedures, health and safety hazards, spill and fire fighting procedures.
- Procedures the facility personnel may use to mitigate or prevent any discharge or a substantial threat of a discharge of oil resulting from facility operational activities associated with internal or external transfers, storage, or use.
- Facility personnel responsibilities and procedures for use of facility equipment that may be used to mitigate and oil discharge.
- Operational capabilities of the contracted response contractor to respond to operational (small) and WCD spills.
- Responsibilities and authorities of the Qualified Individual as described in the facility response plan and company response organization.
- The organizational structure that will be used to manage the response actions, including:

Command and control;

Public information;

Safety;

Liaison with government agencies;

Spill response operations;

Planning;

Logistics support; and

Finance

- The responsibilities and duties of each oil spill management team member within the organizational structure.
- The drill and exercise program to meet federal and state regulations as required under OPA.
- The role of the Qualified Individual in the post discharge review of the plan to evaluate and validate its effectiveness.
- The SF Bay/Delta Area Contingency Plan (ACP).
- The National Contingency Plan (NCP).
- Roles and responsibilities of federal and state agencies in pollution response.
- Available response resources identified in response plan.
- Contracting and ordering procedures to acquire oil spill removal organization resources identified in the Wickland Pipelines OSRP.
- Occupational Safety and Health Administration (OSHA) requirements for worker health and safety (29 CFR 1910. 120).
- Incident Command System/Unified Command System
- Public affairs.
- Crisis management.
- Procedures for obtaining approval for dispersant use or in-situ burning of the spill.
- Oil spill trajectory analyses.
- Sensitive biological, economic, recreational, and cultural areas.

8.2.3 Training for Spill Management Team

Wickland has chosen a response organization based on the Incident Command System (ICS) model. Wickland will train (or insure that training has been completed for appropriate operator personnel) spill response team members according to their functional role within the response organization, Members staffing an operations center need to be trained differently from members whose primary function is logistics. Many of Wickland and its Operator's personnel will be able to draw upon skills they use and training they have obtained in everyday activities of facility operations. Personnel designated to administer the financial duties of spill response and cost documentation are especially likely to have such experience. Other personnel may be asked to fill roles that they may only perform in a crisis situation; therefore, due to the frequency of an actual crisis, these personnel would need extra periodic training to perform crisis functions. The goal is to train these personnel so that the team can function as a

coordinated unit and direct the cleanup activities or preventative measures in an efficient and timely manner.

Wickland will consider a variety of elements in its spill response team training. This training is intended to impart knowledge of the following:

- Notification procedures and requirements for facility owners or operators, internal response organizations, federal and state agencies; and contracted oil spill removal organizations and information required for those organizations.
- Communication systems used for the notifications.
- Information on the materials transferred, stored, or used by the facility, including familiarity with the material safety data sheets, special handling procedures, health and safety hazards, spill and fire-fighting procedures.
- Facility personnel responsibilities and procedures for use of facility equipment that may be used to mitigate and oil discharge.
- The operational capabilities of the organizations to respond to operational (small) and WCD spills.
- Responsibilities and authority of the Qualified Individual.
- The organization structure that will be used to manage the response actions, including:

Command and control;

Public information;

Safety;

Liaison with government agencies;

Spill response operations;

Planning;

Logistics support; and

Finance.

- The responsibilities and duties of the oil spill management team member within the organizational structure, in accordance with designated job responsibilities.
- The training: procedures as described in the response plan for members of the spill management team.
- The drill and exercise program to meet the federal and state regulations as required by OPA.
- Procedures for the post discharge review of the plan to evaluate and validate its effectiveness.
- The SF Bay/Delta Area Contingency Plan (ACP) and the National Contingency Plan (NCP).

- Roles and responsibilities of federal and state agencies in pollution response.
- Available response resources.
- Contracting and ordering procedures to acquire response organization resources, in accordance with designated job responsibilities.
- Basic information on spill operations and oil spill clean-up technology including:

Oil containment;

Oil recovery methods and devices;

Equipment limitations and uses;

Shoreline clean-up and protection;

Spill trajectory analysis; and

Waste storage and disposal considerations.

- Hazard recognition and evaluation.
- Site safety and security procedures.
- OSHA requirements for worker health and safety (29 CFR 1910. 120).
- Incident Command System and Unified Command System.
- Public affairs, as applicable to designated job responsibilities.
- Crisis management, as applicable to designated job responsibilities.
- Personnel management, as applicable to designated job responsibilities.
- Sensitive biological areas, as applicable to designated job responsibilities.
- Procedures for directing the deployment and use of spill response equipment, as applicable to designated job responsibilities.

8.2.4 Contractor Training

Contractor personnel are anticipated to fill roles in Wickland's spill response organization. Wickland, its operators, and other contractors may satisfy training requirements by participating in each others training and drill programs.

8.2.5 HAZWOPER Training

HAZWOPER requirements (29 CFR 1910.120 (q) are based on levels of response recognized by the Occupational Safety and Health Administration (OSHA). OSHA has identified five levels of response, each with increasing levels of required training and expertise. Training criteria for Wickland employees involved in spill response activities are based on the duties and functions associated with the level of response they may be expected to perform. These criteria also apply to contractors used by Wickland in the implementation of this contingency plan. All Wickland and Operator Spill Management Team members will have the appropriate level of HAZWOPER training.

8.2.6 HAZWOPER Training Certification and Documentation

Training and documentation of competency for skilled support personnel and specialists shall be documented. Refresher training or a demonstration of competency is required annually to maintain qualification at a responder level. Records shall be kept of the methodology used to demonstrate competency of the Spill Management Team. HAZWOPER does not specify requirements on the content or duration of refresher training sessions. Competency may be demonstrated through written or oral examinations, or performance in drills.

Wickland will document the training received by its Spill Management Team employee members, and ensure that adequate training and documentation of training is provided by its response contractors. These records will be maintained as long as the individual is assigned duties under the Wickland Pipelines OSCP.

Initial training and the method used to satisfy the refresher training/competency demonstration requirement must be documented in writing for each employee trained for spill response. This documentation shall include lesson plans for material taught and/or the method used to demonstrate an employee's competence.

"Grandfathering" is allowed for Level 1 and 2 responders if they can demonstrate their competence due to knowledge, past training and experience. Past training (including lesson plans or detailed course outlines) shall be documented in order to "grandfather" employees.

The Site Safety Officer will ascertain and document that contract personnel used during a response have received the required training, or equivalent, and are competent.

8.3 DRILLS / EXERCISES

8.3.1 General

Drills serve to evaluate the thoroughness and effectiveness of the emergency response component of the Wickland Pipelines OSCP by testing under simulated conditions. Wickland will test elements of the Wickland Pipelines OSCP during drills. These drills will exercise aspects of the spill response including:

- structure and organization;
- communications;
- equipment capability and response times;
- adequacy of action plans;
- public relations;
- emergency medical services; and
- evacuation.

OSCP drills will be site-specific and scenario-specific. Drills will be performed for applicable types of equipment, including techniques for boom deployment and use, and scheduled during a variety of weather conditions. Safety procedures will be stressed during drills. During the drills, the practical fieldwork required to

contain and clean up a spill will be broken down into a series of elements, as contained in the OSCP.

Although observing vendor demonstrations is worthwhile, it is not a substitute for actual hands-on practice with facility equipment. Drills will be conducted on-site, with site-specific scenarios, using the response resources that would be used in an actual spill. The scope and scheduling of the drills will be designated by Wickland to exercise either components of, or the entire OSCP. However, a drill exercising the entire OSCP will be performed at least once every three (3) years.

Wickland will consider participation in drills directed by the PHMSA, EPA, or other federal and state agencies, or other operators. Drills are designed to exercise either individual components of the plan or the entire response plan.

Wickland will conduct drills in accordance with the National Preparedness for Response Exercise Program (PREP) guidelines. The PREP was developed to establish a workable exercise program which meets the intent of section 4202 (a) of the Oil Pollution Act of 1990 (OPA 90), amending section 211(i) of the Federal Water Pollution Control Act FWQPCA). The PREP is a unified federal effort and satisfies the exercise requirements of the Coast Guard, the Environmental Protection Agency (EPA), the Pipeline and Hazardous Materials Safety Administration (PHMSA) Office of Pipeline Safety, and the Minerals Management Service (MMS). Completion of the PREP exercises will satisfy all OPA 90 mandated federal oil pollution response exercise requirements.

8.3.2 Internal and External Exercises

8.3.2.1 Internal Exercises

Internal exercises are those that are conducted wholly within Wickland's organization. While the internal exercises include personnel such as the Qualified Individual and those affiliated with the response organization, the internal exercises are designed to meet the needs of the organization for spill response. The internal exercises include:

- Qualified Individual notification exercises;
- Emergency procedures exercises;
- Spill management team tabletop exercise; and
- Equipment deployment exercises.

All internal exercises should be self-evaluated and self-certified.

8.3.2.2 External Exercises:

External exercises are those that extend beyond the internal focus of Wickland's and its operators organizations, and involve other members of the response community. The external exercises are designed to examine the response plan and Wickland ability to coordinate with the response community to conduct an effective oil spill response.

The external exercises include:

- Area exercises; and
- Government initiated unannounced exercises.

While the government-initiated unannounced exercises will not usually involve all members of the response community, the involvement of an agency outside Wickland and its operators' organization places it in the category of an external exercise.

8.3.3 Quarterly Notification Drills

Quarterly drills will be performed by the operator at the facility to practice the facility and Qualified Individual notification procedures.

8.3.4 Qualified Individual Notification Exercises

The purpose of the Qualified Individual notification exercise is to ensure that the Primary or Alternate Qualified Individual (or designee, as designated in the response plan) is able to be reached in a spill response emergency to carry out his or her required duties. Contact by telephone, radio, message- pager, or facsimile must be made with the Qualified Individual, and confirmation must be received from him or her to satisfy the requirements of this exercise.

The Qualified Individual notification exercise is not intended to verify phone numbers, points of contact or the notification list contained in the plan. Wickland will update the notification list periodically as part of the normal course of conducting business.

At least once a year, the Qualified Individual notification exercise should be conducted during non-business hours.

- **Applicability**: Facility
- **Frequency**: Quarterly
- **Initiating Authority**: Company Policy
- **Participating Elements**: Facility Personnel and Qualified Individual
- **Scope**: Exercise communications between facility personnel and Qualified Individual
- **Objective**: Contact must be made with a Primary or Alternate Qualified Individual as designated in the response plan
- **Certification**: Self-certification
- **Record Location**: Records to be maintained at the facility
- **Record Retention**: 5 years
- **Evaluation**: Self-evaluation
- **Credit**: Credit will be taken for this exercise when conducted in conjunction with other exercises as long as all objectives are met, the exercise is evaluated, and a proper record is generated. Credit should be

taken for an actual spill response when these objectives are met, the response is evaluated, and a proper record is generated.

8.3.5 Spill Response Team Table Top Drills

Section 3.0 of the Wickland Pipelines OSCP describes Wickland's spill management team organizations. This organization is required to conduct an annual tabletop exercise, in accordance with the PREP guidelines. The response plan must be utilized in the exercise to ensure the spill response team is familiar with the plan and is able to use it effectively to conduct a spill response. At least one tabletop exercise in a triennial cycle shall involve a worst case discharge scenario.

The spill response team tabletop exercises should take into account such changes to ensure that all personnel serving as part of the spill response team during an actual spill have participated in an exercise.

- **Applicability**: Facility spill management team
- **Frequency**: Annually
- **Initiating Authority**: Company Policy
- **Participating Elements**: Spill management team as established in the response plan
- **Scope**: Exercise the spill management team's organization, communication, and decision-making in managing a spill response
- **Objective**: Exercise the spill management team review of:
- **Record Retention**: 5 years
- **Record Location**: Records to be maintained at the facility.
- **Evaluation**: Self-evaluation
- **Certification**: Self-certification
- **Credit**: Credit will be taken for this exercise when conducted in conjunction with other exercises as long as all objectives are met, the exercise is evaluated, and a proper record is generated. Credit should be taken for an actual spill response when these objectives are met, the response is evaluated, and a proper record is generated.

Knowledge of the response plan;

Proper notifications;

Communications system;

Ability to access a response organization;

Coordination of internal organization personnel with responsibility for spill response;

An annual review of the transition from a local team to a regional, national, and international team, as appropriate;

The ability to effectively coordinate spill response activity with the National Response System (NRS) infrastructure. (If personnel from the NRS are not participating in the exercise, the spill management team should demonstrate knowledge of response coordination with the NRS.)

Ability to access information in Area Contingency Plan for location of sensitive areas, resources available within the area, unique conditions of area, etc. (this is only applicable if the Area Contingency Plan is available for the exercise).

At least one spill management team tabletop exercise in a triennial cycle would involve simulation of a worst-case discharge scenario.

8.3.6 Equipment Deployment Exercises

Equipment deployment exercise applies to all plan holders. It is the responsibility of plan holder to ensure that the Equipment Deployment Exercise requirement is met. Wickland will ensure that contracted response organizations have met their obligations for equipment deployment exercises.

Two primary requirements for the equipment deployment exercises are:

1) The personnel that would normally operate or supervise the operation of the response equipment must participate in the exercise. The personnel must demonstrate their ability to deploy and operate the equipment. All personnel involved in equipment deployment and operation must be involved in a training program.

2) The response equipment must be in good operating condition. The equipment must be appropriate for the intended operating environment. The equipment must operate during the exercise. All response equipment must be included in a maintenance program.

3) Response Organization Involvement in Equipment Deployment Exercises

The PREP guidelines identify the minimum amount of equipment that must be deployed in an equipment deployment exercise. This amount is considered to be a representative sample of the equipment. The rationale for this approach is that if the representative sample works, then the rest of the equipment could be expected to work since it would be part of the response organization’s maintenance program. For the personnel, if a representative sample of the response organization's personnel are involved in the deployment exercise and handle their responsibilities effectively, the rest of the personnel could be expected to be knowledgeable and effective since they would be a part of the company's training program. When selecting the equipment and personnel for the exercise, the response organization should ensure that the same equipment and personnel are not used repeatedly for each exercise. The equipment should be selected on a rotational basis, as with the personnel, with the ultimate goal for eventually exercising all of the response organization’s equipment and personnel.

- **Applicability**: Facilities with response equipment cited in their response plan

- **Frequency**: Annually
- **Initiating Authority**: Company Policy
- **Participating Elements**: Facility personnel and response organization
- **Scope**: Deploy and operate response equipment identified in the response plan. The equipment to be deployed would be the minimum amount of equipment for deployment as describe above. All of the response organization personnel involved in equipment deployment operations must be included in a comprehensive training program. All of the response organization equipment must be included in a comprehensive maintenance program. Credit should be taken for equipment deployment conducted during training. The maintenance program must ensure that the equipment is periodically inspected and maintained in good operating condition in accordance with the manufacturer's recommendations and best commercial practices. Wickland's operator must ensure that inspection and maintenance by the response organization is documented and Wickland is provided with inspection and maintenance information.
- **Objectives**: Demonstrate the ability of the personnel to deploy and operate response equipment. Ensure the response equipment is in proper working order.
- **Certification**: Wickland and its operator should ensure that the response organization identified in the OSCP provides adequate documentation that the requirements for this exercise have been met.
- **Record Location**: Records to be maintained at the facility.
- **Record Retention**: 5 years
- **Evaluation**: Self-evaluation
- **Credit**: Wickland's operator should take credit for this exercise when conducted in conjunction with other exercises as long as all objectives are met, the exercise is evaluated, and a proper record is generated. Credit should be taken for an actual spill response when the objectives are met, the response is evaluated, and a proper record is generated.

8.3.7 Unannounced Drills

8.3.7.1 Internal Unannounced Exercises

At least once a year Wickland should ensure that one of the following exercises is conducted unannounced:

- Spill management team tabletop exercise; or
- Equipment deployment exercise.

An unannounced exercise is where the exercise participants do not have prior knowledge of the exercise, as would be the situation in an actual spill incident.

To ensure an adequate posture for response preparedness, and to satisfy the OPA 90 requirement for unannounced exercises, it is necessary to have an

exercise program that is comprised of both announced and unannounced exercises. The requirements for the annual unannounced exercise are necessary to maintain the level of preparedness necessary to effectively respond to a spill.

Response to an actual spill should be taken as credit for the unannounced exercise requirement, if the response was evaluated.

8.3.7.2 Government-Initiated Unannounced Exercises

The government-initiated unannounced exercises are designed to give the agency with primary regulatory oversight over a particular industry the opportunity to evaluate, on a random basis, the response preparedness of that industry. For Coast Guard-regulated vessels and facilities, the government-initiated unannounced exercises would be limited to four per area per year. For PHMSA-regulated pipelines, the government-initiated unannounced exercises would be limited to 20 annually across the nation.

A plan holder directed to participate in a government-initiated unannounced exercise required to participate as directed. The cost of the unannounced exercise would be borne by the response plan holder.

If Wickland or its operator has participated in a government-initiated unannounced exercise they would not be required to participate in another federal government-initiated unannounced exercise for at least 36 months from the time of the last exercise. Wickland must maintain documentation of this participation.

- **Applicability**: Regulated facility response plan holders within the area.
- **Frequency**: Annually, if selected. (Plan holders who have participated in a PREP government-initiated unannounced exercise will not be required to participate in another one for at least 36 months from the date of the exercise.)
- **Initiating Authority**: EPA, USCG
- **Participating Elements**: Regulated facility response plan holders
- **Scope**: Unannounced exercises are limited to a maximum of four exercises per area per year. Exercises are limited to approximately four hours in duration. Exercises would involve response to an average most probable discharge scenario. Exercise would involve equipment deployment to respond to spill scenario.
- **Objectives**: Conduct proper notifications to respond to unannounced scenario of an average most probable discharge. Demonstrate that the response is:

  Timely;

  Conducted with adequate amount of equipment for scenario; and

  Properly conducted.
- **Certification**: EPA, USCG
- **Verification**: EPA, USCG

- **Record Retention**: 5 years
- **Record Location**: Records to be maintained at the facility.
- **Evaluation**: Evaluation to be conducted by initiating agency.
- **Credit**: Credit should be taken for an actual spill response when these objectives are met, the response is evaluated, and a proper record is generated. Plan holders participating in this exercise should also take credit for notification and equipment deployment exercises.

8.4 Triennial Exercise of the Entire Response Plan

Every 3 years all components of the entire response plan must be exercised. Rather than requiring each plan holder to conduct a major exercise every 3 years, the PREP allows for the individual components to be exercised in portions through the required exercises.

In the triennial cycle, the following internal exercises must be conducted:

- 12 Qualified Individual notification exercises;
- 3 spill management team tabletop exercises - one must involve a worst case discharge scenario;
- 3 unannounced exercises - any of the exercises, with the exception of the Qualified Individual notification exercise, if conducted unannounced, would satisfy this requirement;
- Equipment deployment exercises as described below:

For pipelines:

Three (3) pipeline equipment deployment exercises (using either response organization and/or operator owned equipment)

8.5 Area Exercises

The purpose of the area exercise is to exercise the entire response community in a particular area. An area is defined as "that geographic area for which a separate and distinct Area Contingency Plan has been prepared, as described in OPA 90". The response community includes the federal state and local government and industry. The area exercises are designed to exercise the government and industry interface for spill response.

The goal of the PREP is to conduct 20 area exercises per year nationwide, 60 within a triennial cycle. This method should ensure that all areas of the country are exercised triennially. Six of the 20 annual area exercises would be led by the government, and 14 would be led by industry plan holders. All of the area exercises will be developed by an exercise design team. The exercise design team is comprised of representatives from the federal state and local government and industry. A lead plan holder would lead each area exercise. The lead plan holder is the organization (government or industry) that holds the primary plan that is exercised in the area exercise. The lead' plan holder would have the final word on designing the scope and scenario of the exercise. The U.S. Coast

Guard or the EPA would be the lead agency for the 6 government led exercises, with PHMSA and MMS participating as appropriate.

A suggested mix of participants for the industry led area exercises would include:

- Vessels (6 exercises);
- Marine transportation-related (MTR) facilities (2 exercises);
- Onshore and certain offshore non-transportation-related facilities (2 exercises)
- Pipelines (2 exercises); and
- Offshore facilities (2 exercises).

The area exercises do not necessarily have to be large scale productions. The scenario does not always have to involve a worst-case discharge. The primary purpose of the area exercise is to activate and observe the response infrastructure in the area, and the ability of the entire response community to effectively conduct a spill response. The focus should be on the interaction between the responsible party and the federal state and local government to exercise both the Area Contingency Plan and the responsible party's plan. There will be some level of equipment deployment; whatever is appropriate for the scenario. The following are the PREP recommendations for the area exercises:

- Each exercise should be approximately 8-12 hours in duration. The exercises may be longer, if agreed to by the exercise design team
- The area response mechanism would be evaluated in each area exercise. The unified command would be exercised.
- The lead plan holder will have the primary voice and final decision authority in the exercise design. However, exercise design should be conducted as a cooperative effort of the entire exercise design team.
- The exercise scenario will involve some amount of equipment deployment. The extent of equipment deployment should be determined by the lead plan holder after consulting with the exercise design team

An industry plan holder that participates in an area exercise would not be required to participate in another area exercise for a minimum of 6 years. Plan holders are responsible for funding their participation in the area exercises.

An evaluation report should be completed not later than 60 days after completion of the area exercise. The evaluation report would be completed by the joint evaluation team

8.6 Credit for Spill Response

Wickland may take credit for internal exercises conducted in response to actual spill. The spill response must be evaluated. Wickland must determine which exercises were completed in the spill response. This determination should be based on whether the response effort would meet the objectives of the exercise as listed in the PREP guidelines. Wickland should document the exercises completed.

8.7 Drill Records

Wickland will ensure that records sufficient to document drills for facility personnel and the spill management team are maintained for 5 years following completion of drills. Proper documentation for self-certification should include, as a minimum, the following information:

- The type of exercise.
- Date and time of the exercise.
- A description of the exercise.
- The objectives met in the exercise.
- The components of the response plan exercised.
- Lessons learned.

This documentation must be in writing and signed by a Qualified Individual.

Records of drills must be made available to the U.S. Coast Guard and EPA Administrator upon request.

8.8 Training during Emergency Response

Training is designed to improve safety awareness and response capability to minimize potential health effects, environmental impact and property damage, as well as to comply with applicable regulations. In the event of a major incident, volunteers from the community may wish to participate in the cleanup. Volunteers will report to the appropriate Field Supervisor or Contractor. However, it must be noted that OSHA Section 1910. 120 require that a minimum amount of training in hazardous material handling be done before any work is performed.

8.9 Equipment Inspection and Testing

Wickland maintains only minor spill control expendables such as sorbent, and relies on the response organization for major spill response equipment. In selecting the response organization, Wickland has verified that appropriate equipment testing, inspection and data recording programs are in-place. Continuance of these response organization programs will be verified at the time of any contract renewal.

An inspection schedule will be provided in the event that Wickland acquires any significant response equipment.

9.0 PLAN REVIEW, UPDATING, AND RESUBMISSION

9.1 Responsibility

The Managers of the SMF and SJC Pipelines have the responsibility for review, updating and distribution of revised copies of this OSCP. The OSCP shall be reviewed and revised according to regulatory requirements, and additionally at the discretion of Wickland Management.

Revisions to the plan will normally be made by replacing sequentially numbered pages or sections with replacements. Revisions will be distributed to all plan copy holders with a transmittal sheet identifying the revision number, section and page number, date any other instructions. Pen and ink changes may be made for minor revisions (such as phone number corrections). Revisions should be inserted immediately, and logged in the change records in each copy.

Wickland will require that its operator also conduct required review and updating of its emergency plans.

9.2 PHMSA Requirements

PHMSA requires each operator to review its OSCP at least every five years from the date of submission and modify the plan to address new or different operating conditions or information included in the plan. If a new or different operating condition or information would substantially affect the implementation of the response plan, the operator must immediately modify its response plan to address the changes and, within 30 days of making such a change, submit the change to PHMSA. Examples of changes in operating conditions that would cause a significant change to an operator's response plan include:

- An extension of the pipeline or construction of a new pipeline in a response zone not already covered;
- Relocation or replacement of the pipeline in a way that significantly affects the information in the response plan;
- The type of oil transported, if the type affects the required response resources;
- Changes in the response organization;
- Changes in emergency response procedures;
- Changes in the Qualified Individual;
- A change in the NCP or ACP that has a significant impact on the equipment appropriate for full implementation of the Plan; or
- Any other information that could impact implementation of the Plan.

9.3 Additional Review and Updating

Information valuable to Wickland emergency response preparations will be developed periodically by others. Such information may include changes and

additions to the SF Bay/Delta ACP, emergency planning information developed by state and federal agencies, and the experiences of other local operators. Wickland will monitor the activities of others and will modify its plans as appropriate.

APPENDIX A-1 SMF PIPELINE ROW / FACILITY DESCRIPTION

A-1.1 ROW Description

The SMF Pipeline is located in western unincorporated Sacramento County, eastern unincorporated Yolo County, and in the northwestern portion of the City of West Sacramento. The majority of the pipeline corridor is located within agricultural lands, while the metering station is located within a developed area.

KMEP Pipeline Interconnect

A 4302 foot 12 inch pipeline interconnects the KMEP common carrier pipeline to the Wickland Metering Station. This pipeline interconnect extends along the rear of an industrial area near the intersection of Capitol Avenue and Interstate 80 in the City of West Sacramento to the metering station near the end of Commerce Drive. There is a bike path and drainage ditch immediately to the north of the alignment, and a levee which separates the pipeline from undeveloped agricultural land further to the north.

Wickland Metering Station

The metering station is located at [redacted] an industrial zoned area of the City. It has a total footprint of 65' x 65' (4,225 square feet) in a one acre parcel of land. The lands surrounding the metering station primarily consist of heavy industry to the south, east and west. Uses to the north include an east-west trending public bike path and the Southern Pacific Railroad mainline tracks, which separate the metering station from undeveloped agricultural lands to the north.

Wickland Pipeline Corridor

The pipeline corridor extends westerly form the [redacted] 0. It turns north at approximately [redacted] where it is predominantly located adjacent to agricultural fields along farm road right-of-ways. The Sacramento Bypass bisects the southern Yolo County portion of the pipeline corridor at [redacted]. The corridor continues roughly north through agricultural lands, crossing the Yolo Shortline Rail Road at [redacted], to the Sacramento River at [redacted]. It crosses under the Sacramento River and continues north through agricultural lands, passing under Interstate 5 from [redacted]. The corridor continues north to [redacted] where it turns west, passing under the Sacramento International Airport runways to the SIA tank farm.

The lands surrounding the pipeline corridor primarily consist of flat open agricultural lands used for grain production, orchards, and row crops. The remainder of the land surrounding the pipeline corridor consists of natural features including rural grasslands, riparian shrub and woodlands, and emergent

wetlands found in the Sacramento Bypass. Additional manmade features within the vicinity of the pipeline include several farm buildings and five permanent residences.

Detailed description of environmental conditions along and adjacent to the ROW are provided in the Sacramento International Airport Jet Fuel Pipeline and Tank Farm Project, Draft Environmental Impact Report dated March 2001. This EIR is maintained at the Wickland headquarters.

A-1.2 Pipeline System and Operation Description

The 12 inch SMF Pipeline is designed to deliver jet fuel from the 20 inch Kinder Morgan Energy Partners (KMEP) common carrier pipeline in West Sacramento approximately 9.5 miles to the Sacramento International Airport (SMF) in North Sacramento. The pipeline consists of the following:

- A meter station in West Sacrament that provides for the connection and isolation between the KMEP and Wickland pipelines, metering for custody transfer, meter proving, and pig launching;
- An interconnecting pipeline; and
- A receiving station at SMF that provides for the connection and isolation between the SMF Pipeline and the SMF tank farm, a backpressure valve, flow meter for leak detection, and pig receiving.

<u>System Operating Modes</u>

The pipeline supports the following modes of operation:

Leak Detection – Gross leak detection during operation of the pipeline.

Startup – Initial filling of the pipeline and any subsequent refilling after maintenance.

Standby – The pipeline is filed with closed isolation valves at both ends.

Fuel Transfer – Fuel is transferred from the KMEP pipeline to the SMF tank farm. Transfer operations are controlled by KMEP. Following receipt of a “ready to receive” signal from the SMF Pipeline, KMEP will reposition their pipeline valves to initiate and terminate the transfer operation. There are two modes of operation for transfer of fuel from the KMEP pipeline to the SMF pipeline: Full Flow and Stripping. In either mode of operation, no trans-mix is to enter the SMF Pipeline.

Full Flow – The entire flow from the KMEP pipeline is diverted into the SMF Pipeline.
Stripping – A portion of the flow in the KMEP pipeline is diverted into the SMF Pipeline.

Pigging – Launching and recovering a pig through the pipeline.

(b) (7)(F) [redacted]

Process and Environmental Conditions

Pipeline Product:	Jet A Vapor Pressure: 0.7 psia @ 100 F Specific Gravity: 0.81 @ 60F Density: 6.75 lb/gal Viscosity: 1.6 cSt @ 104 F Flash Point: 100 – 106 F
Design Temperature:	-20 to +150F (temperature range over which structural integrity must be maintained)
Operating Temperature:	40 to 80F (Product temperature range over which metering accuracy must be maintained)
Design Pressure:	1440 psig (600# Class @ 100F)
Pipeline Operating Pressure: At West Sacramento (Existing 14” line)	513 – 646 psig in full flow mode 182 – 252 psig in stripping mode

(b) (7)(F) [redacted]

Environmental Temperature:	Annual Average 61F Monthly Average 93F (highest) Monthly Average 38F (lowest) Record High 115F Record Low 18F
Precipitation:	Monthly Average 3.7” (highest) Record Month 12.6”
Seismic Zone:	Three, in accordance with 1997 UBC

Civil/Cultural

<u>West Sacramento</u>

Site grading and drainage directs runoff towards the storm collection system for Commerce Drive.

(b) (7)(F) [redacted]

All-weather roadway access is provided for maintenance purposes, pig movement, vacuum truck access, or off-loading the clean oil tank.

A small control building capable of being locked is provided to house the power distribution panels, local control station, PLC, RTU(s), UPS, etc.

SMF Tank Farm

Site grading, drainage, and roadway areas are incorporated into the tank farm design.

(b) (7)(F) [redacted]

Mechanical

Common

Potential points of leakage are located at least 10 feet within the fenced perimeter.

General Twin-seal double block and bleed valves are used in applications where a valve defines a custody transfer boundary. Valves and pipeline flow are shown in the pipeline Flow Diagram (Figure A.1). Power operated valves are used in all runs that will be pigged. Power operated valves also have provision for manual operation upon a loss of power.

(b) (7)(F)

times of 30 – 45 seconds for the 12" valves to minimize surge effects on their pipeline.

Thermal relief valves are provided as required by code, to protect portions of piping from over-pressure due to solar heating or static fuel in isolated pipeline segments.

Manual isolation valves are provided at the station boundaries. (b) (7)(F) [redacted]

There are no underground pipe flanges.

Insulated connections are provided to isolate the Wickland cathodic protection system from the KMEP and SIA cathodic protections systems.

Aboveground piping and equipment with the potential for leakage or releases during operation and maintenance are located within contained areas. The containment areas are capable of holding the contents of the protected piping and equipment plus the water from a 100 year storm.

(b) (7)(F) [redacted]

West Sacramento

Mainline and branch line isolation valves are placed on the KMEP pipeline adjacent to the KMEP/Wickland connection. In addition, there is a full flow relief valve and inlet and outlet block valves to provide a relief path in the event of a transient around the closed mainline isolation valve.

A strainer is provided to ensure that debris does not enter the pipeline.

KMEP is responsible for, and has control of, the metering and custody transfer operation at West Sacramento, including the main line and branch line isolation valves, the turbine meter, meter prover, and flow control valves.

KMEP requires that the flow control valve fail "as-is" upon loss of power or loss of signal. The purpose of this requirement is to minimize transients on the KMEP pipeline.

An auto-sampler is located downstream of the flow control valve (downstream of the KMEP-operated portion of the meter station). The return from the clean oil system to the pipeline is located downstream of the auto-sampler.

A closed clean oil collection system which has a collection tank and transfer pump is provided to collect fuel from operation of:

- The double block valve;
- The meter prover;
- The pig launcher,
- Thermal relief valves; and
- System drains.

The collection tank utilizes a double tank wall to prevent leakage into the surrounding soil. It is provided with a fill connection to allow pumping the contents of above ground piping into the tank when it is necessary to drain the system. In addition an alternative pump out connection is provided for pumping out off-spec tank contents. The collection tank is sized with a useable volume of 120% of the following mutually exclusive events:

- Draining the meter station piping between the manual isolation valves to allow maintenance on the meter, meter prover, strainer, etc.;
- Operation of the meter prover;
- Pig Launcher; and
- 200% of anticipated thermal expansion of the fuel contained between the closed KMEP connection isolation valve and the backpressure regulator at the SIA tank farm.

A transfer pump is provided for the clean oil collection tank to deliver the contents back into the pipeline. The transfer pump will deliver the collection tank contents into the pipeline downstream of the automatic sampler, so that the sampler collects samples of the fuel delivered from KMEP, not what is in the tank. The transfer pump is operated automatically based on the level in the clean oil collection tank.

(b) (7)(F) [redacted]

Tank Farm

An oil collection system, which drains to a local sump at the tank farm, will be used to collect fuel from operation of:

- The double block valve and bleed valves;
- Pig Reveiver;
- Thermal relief valves; and
- System drains.

(b) (7)(F)

[redacted]

.

The tank farm is responsible for overpressure protection for the tank farm and associated piping. The tank farm is capable of accepting full flow from the pipeline by virtue of providing 100% capacity relieving capacity at full design pressure.

(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

West Sacramento

A turbine meter and a meter prover will be utilized to verify custody transfer. The turbine meter has its own line thermometer and well, temperature transmitter and well, line pressure gauge and tap, verified/certified line thermometer and well, verified/certified line pressure gauge and pressure transmitter, PT and tap.

A densiometer is located on the KMEP pipeline upstream of the KMEP/Wickland connection to detect the passage of product interfaces.

An auto sampler is provided at the West Sacramento terminal to take periodic samples of each transfer. A static mixer, upstream of the auto sampler is included to ensure good mixing.

Redundant air conditioning is provided to maintain an acceptible operating environment for electronic components located within the building.

(b) (7)(F)

[redacted]

Electrical

Common

The electrical equipment in proximity to piping is classified as Class 1 Division 2, Group D.

West Sacramento

A commercial service drop from PG&E provided power to the site.

(b) (7)(F)

[redacted]

Yard lighting that is provided that is activated at night by motion sensors or manually.

Tank Farm

Two 480 V electrical power feeds, one normal source and one standby generator source, are provided at the tank farm. The tank farm standby generator will back up the normal power feed provided from the tank farm power system.

A UPS is provided to ensure that at least 20 minutes of back-up power is available to the Wickland control system at the tank farm. The UPS provides power for indication, but not power for activation of any of the control devices (including the valve used for emergency shutdown).

Power from the SIA tank farm standby generator is relied upon to actuate control devices when normal power is not available.

All electrical equipment is suitable for outdoor environmental conditions where installed outside of the control cabinents. UPS and RTU equipment installed in cabinents are cooled by redundent air-conditioning units.

Grounding of electrical equipment consists of buried ground rods and 2/0 AWG bare copper wire grounding electrode conductor designed to meet NEC code.

All power routing to equipment is below grade. All conduit, fittings and connections are hazardous area classified.

Cathiodic Protection

Underground piping Cathodic Protection

Cathodic protection is installed on all buried piping. The Cathodic Protection System (CPS) controls the electromechanical corrosion of the exterior surfaces of ferrous piping buried in soil by making the protected surfaces cathodic. The CPS conforms to NACE RP01069 requirements.

The cathodic protection system uses galvanic (sacrificial) anode current systems, reference electrodes, and field test stations. Field test stations provide for the measurement of anode current and pie to soil potential. Permanent reference electrodes are placed at test stations installed in paved areas where contact to the soil is not possible.

Storage Tanks

Aboveground storage tanks are installed on concrete pads and do not require cathodic protection.

A-1.3 PIPELINE MAPS

Maps of the pipeline alignment and surrounding area are provided in Figures A-1.2 (Index map), A-1.3 (10+00 to 140+00), A-1.4 (100+00 to 240+00), A-1.5 (230+00 to 390+00) and A-1.6 340+00 to 520+00).

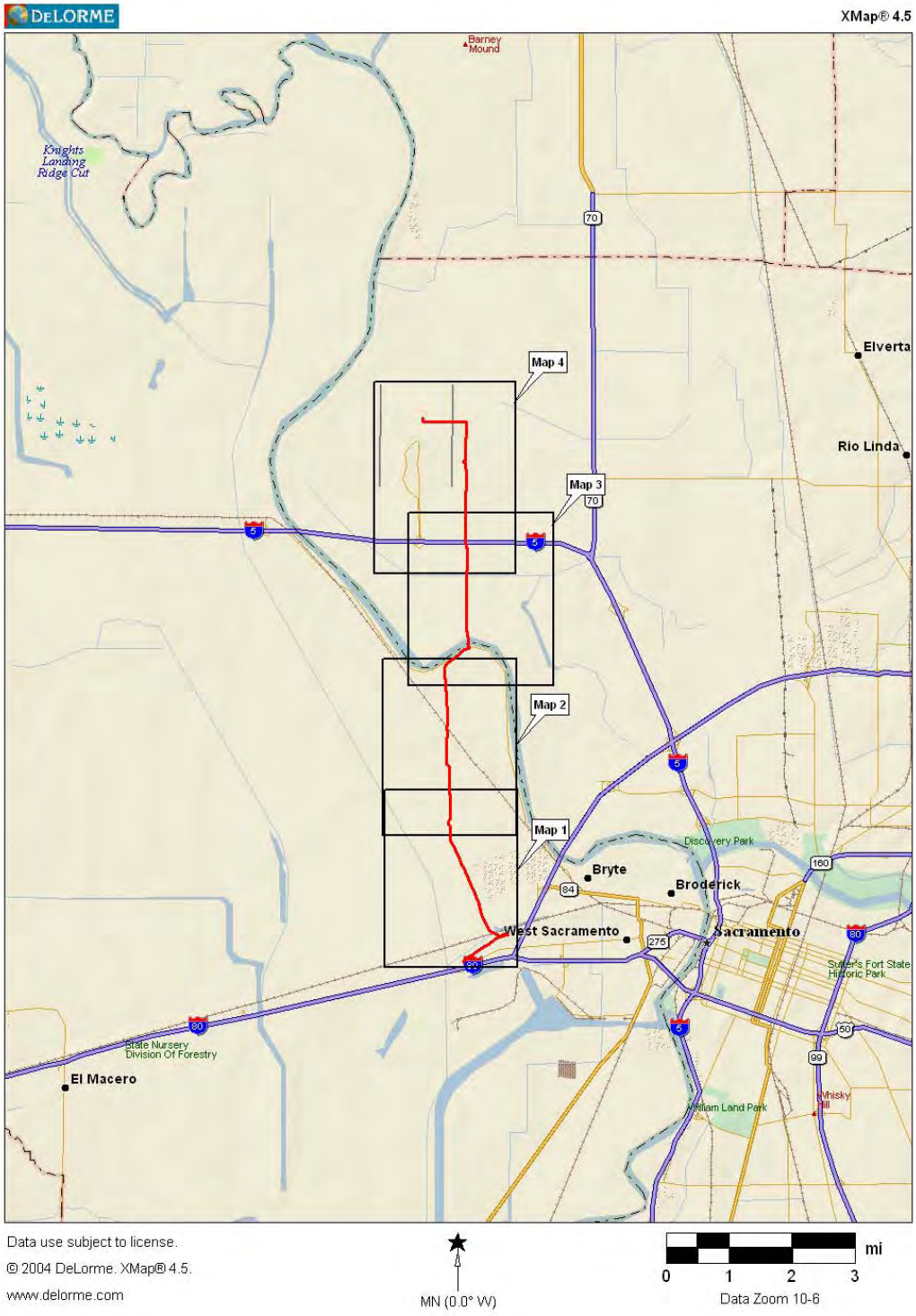


Figure A-1.2 Index Map

(b) (7)(F)

(b) (7)(F)

(b) (7)(F)

(b) (7)(F)

APPENDIX A-2 SJC PIPELINE ROW / FACILITY DESCRIPTION

A-2.1 ROW Description

The SJC Pipeline is located in the City of San Jose, California. The San Jose Airport Pipeline (SJC Pipeline) is approximately 2 miles long and connects an existing Kinder Morgan Energy Partners petroleum products storage terminal (KMEP Terminal) in San Jose to a new jet fuel tank farm (SJC Tank Farm) at the San Jose International Airport (SJC). The 8" SJC Pipeline is dedicated to shipping jet fuel to the SJC Tank Farm.

KMEP Terminal

The KMEP Terminal is located at 2150 Kruse Drive in San Jose, CA. The terminal is owned operated by Kinder Morgan Energy Partners and has a total of 34 above ground petroleum product storage tanks; four of which are dedicated to the storage of jet fuel. All the tanks are within a series of containment berms. The KMEP Terminal receives product from the KMEP owned SFPP Pipeline and is used by Bay Area refineries to supply motor fuels to the greater San Jose Metropolitan Area. With the exception of the SJC Pipeline, all other products at the KMEP Terminal are loaded out by tanker truck. The KMEP Terminal is located in a developed, light industrially zoned area with Coyote Creek immediately to the east of the KMEP Terminal property.

Wickland Pump Station

The Wickland pump and pig launcher equipment is located in the containment and manifold area of the KMEP Terminal at 2150 Kruse Drive in San Jose, CA. Wickland's operations control office is located adjacent to the station equipment. The area immediately surrounding the control office and station equipment consist of heavy industry facilities including petroleum piping, storage tanks, pumps and related equipment.

Wickland Pipeline Corridor

The SJC Pipeline corridor predominately traverses developed office and industrially zoned land in an area roughly bounded by the Bayshore Freeway (Interstate 101), Trimble Road, Charcot Avenue and the KMEP facility located at Kruse Drive and Dado Street. The 2 mile pipeline is located in San Jose City public streets and on private office or industrially zoned property. The pipeline is horizontally directionally drilled (HDD) under major streets such as Dado Drive, North First Street and Orchard Parkway and under the Guadalupe River.

As a result of the number of horizontal direction drills (HDD) used to install the SJC Pipeline, the pipeline averages a depth below ground level of approximately 22 feet. For all areas where open trench installation was utilized, the pipeline is buried with minimum coverage of 60 inches.

The pipeline corridor extends westerly form the KMEP Terminal under Dado Drive using the HDD method of installation and crosses under Junction Avenue at approximately [redacted]. Using open trench construction, it turns north for a short distance and at approximately [redacted] turns west again where it is located in an undeveloped field adjacent to a light industrial development. [redacted] a new HDD begins and the pipeline crosses under the Union Pacific Railroad and Zanker Road at a depth of approximately 28 feet. At [redacted] the pipeline turns north in Zanker Road for approximately 900 feet where the open trench method of installation was used. At the intersection of Zanker Road and Component Drive the pipeline turns west and a new HDD is started at station [redacted]. Continuing east, the third HDD path crosses under North First Street at [redacted] and exits at [redacted]. Immediately a fourth HDD is utilized and the pipeline continues west crossing under Orchard Parkway at [redacted]. The corridor continues roughly west in an open 80 foot PG&E right-of-way to station [redacted] At this location a final HDD is utilized to cross under the Guadalupe River with an average depth below the river exceeding 50 feet. The corridor continues northwest to [redacted] where it terminates and connects to the Wickland equipment station at the SJC Tank Farm.

Detailed description of environmental conditions along and adjacent to the ROW are provided in the San Jose International Airport Jet Fuel Pipeline Project, Initial Study and Mitigated Negative Declaration dated July 2009. This document is maintained at the Wickland headquarters.

SJC Tank Farm

The new SJC Tank Farm is located on Airport property at 2500 Seaboard Avenue, San Jose CA. The facility is owned and operated by a consortium of airlines operating at the San Jose International Airport and has a total of 3 above ground petroleum product tanks dedicated to the storage of jet fuel. All the tanks are within containment berms and the fuel is loaded out by refueler trucks for delivery to commercial aircraft services the airport. The SJC Tank Farm is located in a commercial and light industrial area and is adjacent to the Guadalupe River corridor and the Bayshore Freeway (Interstate 101).

A-2.2 Pipeline System and Operation Description

Wickland Pipelines LLC (Wickland) operates a new pipeline delivering jet fuel to the San Jose International Airport (SJC Airport). The 8" SJC Pipeline delivers fuel from the KMEP Terminal in San Jose approximately 2 miles to the new jet

fuel tank farm (SJC Tank Farm) at the SJC Airport. The new SJC Pipeline system consists of the following:

- An interconnection piping manifold in the KMEP Terminal that provides for a connection and isolation between four existing jet fuel tanks and the new Wickland pipeline.
- Pipeline delivery equipment skids in the KMEP Terminal that provides for pumping, metering for custody transfer, meter proving, and pig launching.
- An interconnecting pipeline approximately 2 miles long from the KMEP Terminal to the SJC Tank Farm at the San Jose airport.
- A receiving equipment skid at the SJC Airport that provides for the connection and isolation between the Wickland pipeline and the new tank farm, two filters, a backpressure valve, flow metering for leak detection, and pig receiving.

System Operating Modes

The pipeline supports the following modes of operation:

Leak Detection -- Gross leak detection during operation of the Pipeline System.

Startup -- Initial filling of the pipeline and any subsequent refilling after maintenance.

Standby -- The pipeline is filled with closed isolation valves at both ends.

Fuel Transfer: Fuel is transferred from the KMEP Terminals jet fuel tanks to the SJC Tank Farm. Transfer operations are controlled by Wickland. Following receipt of a “ready to receive” signal from the SJC Tank Farm and a "ready to deliver" signal from the KEMP Terminal, Wickland will reposition their pipeline valves and start (or stop) a pipeline transfer pump to initiate (or terminate) the transfer operation. There are two modes of operation for transfer of fuel to the SJC Tank Farm: full-flow and low flow. In either mode of operation, no trans-mix is to enter the SJC Pipeline.

Full-Flow – The pipeline will deliver 1500 bph.
Low-Flow – The pipeline will deliver 700 to 800 bph.

Pigging: Launching and recovering a pig through the pipeline.

(b) (7)(F) [redacted]

Process and Environmental Conditions

Pipeline Product:	Jet A Vapor Pressure: 0.7 psia @ 100 F Specific Gravity: 0.81 @ 60F Density: 6.75 lb/gal Viscosity: 1.6 cSt @ 104 F Flash Point: 100 – 106 F
Design Temperature:	-20 to +150F (temperature range over which structural integrity must be maintained)
Operating Temperature:	40 to 80F (Product temperature range over which metering accuracy must be maintained)
Design Pressure:	285 psig (150# Class @ 100F)

(b) (7)(F) [redacted]

Pipeline Operating Flow:	1500 bph (full flow mode) 700 – 800 bph (low flow mode)
Seismic Zone:	Four, in accordance with 2007 CBC

Civil/Cultural

KMEP Terminal

Site grading and drainage directs runoff towards the storm collection system for Commerce Drive.

(b) (7)(F) [redacted]

All-weather roadway access is provided for maintenance purposes, pig movement and vacuum truck access.

A small control building capable of being locked is provided to house the operator and PLC HMI.

SJC Tank Farm

Site grading, drainage, and roadway areas are incorporated into the tank farm design.

(b) (7)(F) [redacted]

Mechanical

Common

Potential points of leakage are located at least 10 feet within the fenced perimeter.

(b) (7)(F) [redacted]

(b) (7)(F)

[redacted]

(b) (7)(F)

There are no underground pipe flanges.

Insulated connections are provided to isolate the Wickland cathodic protection system from the KMEP and SJC Tank Farm cathodic protections systems.

Aboveground piping and equipment with the potential for leakage or releases during operation and maintenance are located within contained areas.

The pipeline is capable of being shutdown in an emergency by closing isolation valves at both the KMEP and SJC stations.

KMEP Terminal

Isolation valves will be located on the pipeline at the delivery skids. The metering and custody transfer operation will occur at the KEMP Terminal along with the operation of the pipeline delivery pumps. KMEP is responsible for, and has control of, the metering, custody transfer and tank line-up operation including the turbine meter, meter prover, and flow control valve. Wickland is responsible for product quality testing and certification and operation of the isolation valves, delivery pumps and pig launcher. The pump controls provide for remote and manual operation of the pumps and blocking of its operation during pipeline maintenance.

A closed clean oil collection system will be provided by KMEP to collect fuel from operation of:

- The meter prover,
- Transfer pumps
- Pig launcher
- Thermal relief valves, and
- System drains

A pump out connection shall be provided for pumping out off-spec contents to a truck for processing.

SJC Tank Farm

A clean oil collection tank will be included in the receiving skid and will be used to collect jet fuel from operation of:

- Draining the filters,
- The double block and bleed valves,
- Pig receiver,
- Thermal relief valves, and
- System drains

A transfer pump will be provided for the clean oil collection tank to deliver the contents back into the pipeline. The transfer pump will be operated automatically based on the level in the clean oil collection tank. The transfer pump is located within a spill containment area. The clean oil collection tank is provided with local level indication, level indication within the Wickland control system, and high-level alarms for the operator, and automatic controls and level switches for operation of the associated transfer pump. The pump controls also provide for manual operation of the pump and blocking of its operation during pipeline maintenance.

A power operated isolation valve will be provided on the Wickland pipeline receiving skid at the SJC Tank Farm that is hardwired into the emergency shutdown scheme. The valve shall be powered from the SJC Tank Farm emergency power source in the event of a loss of offsite power.

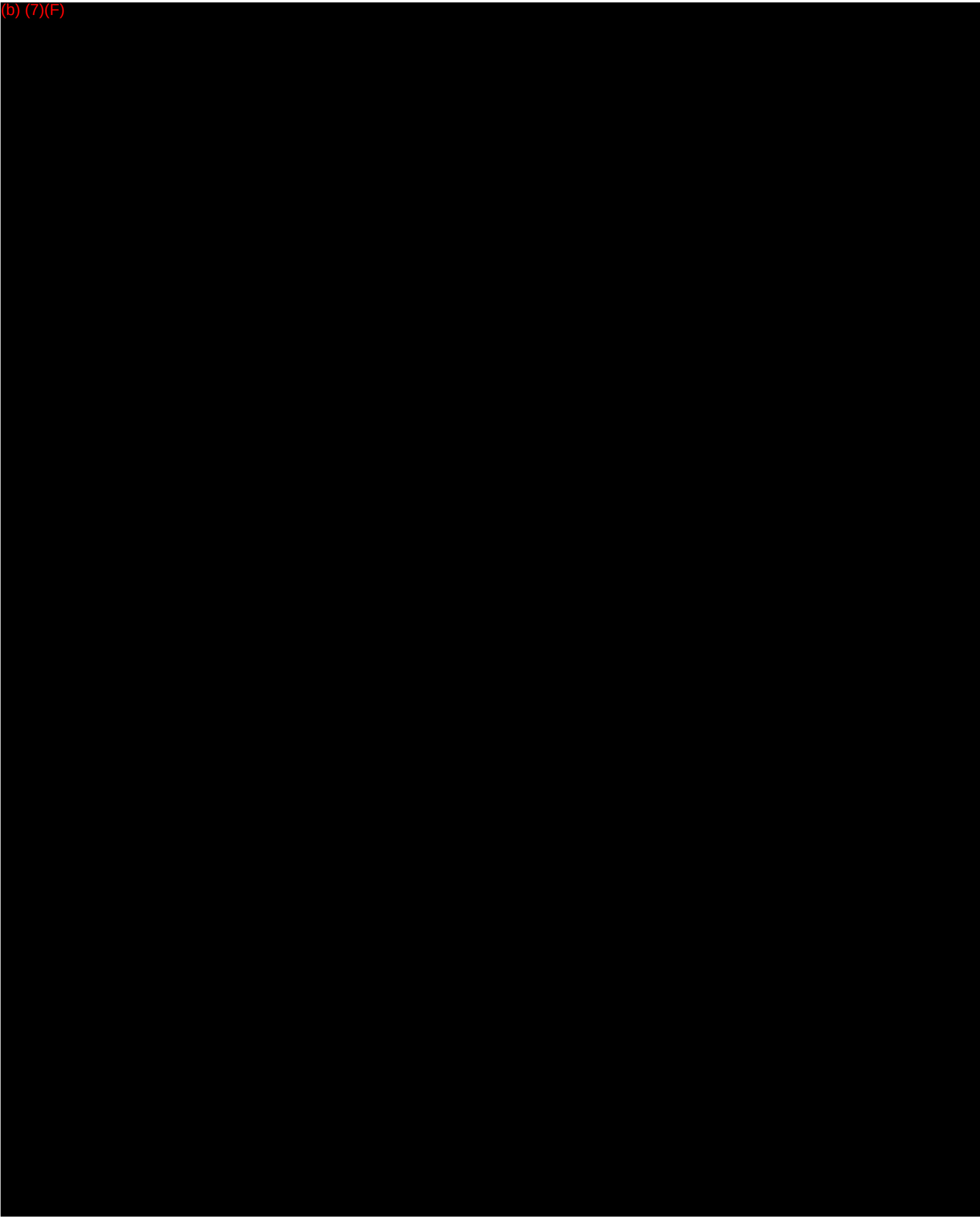
The SJC Tank Farm has over-pressure protection for the tank farm and associated piping. The SJC Tank Farm is capable of accepting full flow from the pipeline at full design pressure.

Instrumentation and Controls

Common

Wickland will monitor the mainline isolation valves, pumps, flow control valve and pressure control valve on the pipeline. The (b) (7)(F) [redacted]

(b) (7)(F)



(b) (7)(F)

[redacted]

(b) (7)(F)

[redacted]

(b) (7)(F) [redacted]

Electrical

Common

The electrical equipment in proximity to piping is classified as Class 1 Division 2, Group D.

KMEP Tank Farm

Existing service at the KMEP tank farm will be the source of electrical power to the site.

An uninterruptible power supply (UPS) will be provided to supply emergency power for a minimum of four hours to the instrumentation systems to provide sufficient time for manual operator action. Emergency power for the clean oil collection tank transfer pump is not required since the instrumentation, by virtue of the UPS, provides indication of tank level and the UPS provides sufficient time for manual operator action.

Existing yard lighting at the KMEP Terminal services the area..

KMEP requires the following circuit segregation for the conduit runs to the skid:

- 480/120 V power
- 120 VAC discrete
- 24 VDC power and control
- Analog/communication signals.

SJC Tank Farm

Two 480 V electrical power feeds, one normal source and one standby generator source, are provided at the tank farm. The tank farm standby generator will back up the normal power feed provided from the tank farm power system.

A UPS is provided to ensure that at least 20 minutes of back-up power is available to the Wickland control system at the tank farm. The UPS provides power for indication, but not power for activation of any of the control devices ((b) (7)(F) [redacted]).

Power from the SJC Tank Farm standby generator is relied upon to actuate control devices when normal power is not available.

All electrical equipment is suitable for outdoor environmental conditions where installed outside of the control cabinents. UPS and RTU equipment installed in cabinents are cooled by redundent air-conditioning units.

Grounding of electrical equipment consists of buried ground rods and 2/0 AWG bare copper wire grounding electrode conductor designed to meet NEC code.

All power routing to equipment is below grade. All conduit, fittings and connections are hazardous area classified.

Cathodic Protection

Underground piping Cathodic Protection

Cathodic protection is installed on all buried piping. The Cathodic Protection System (CPS) controls the electromechanical corrosion of the exterior surfaces of ferrous piping buried in soil by making the protected surfaces cathodic. The CPS conforms to NACE RP01069 requirements.

The cathodic protection system uses galvanic (sacrificial) anode current systems, reference electrodes, and field test stations. Field test stations provide for the measurement of anode current and pipe to soil potential. Permanent reference electrodes are placed at test stations.

A-2.3 PIPELINE MAPS

A map of the pipeline alignment and surrounding area is provided in Figure A-2.2 for the entire pipeline route.

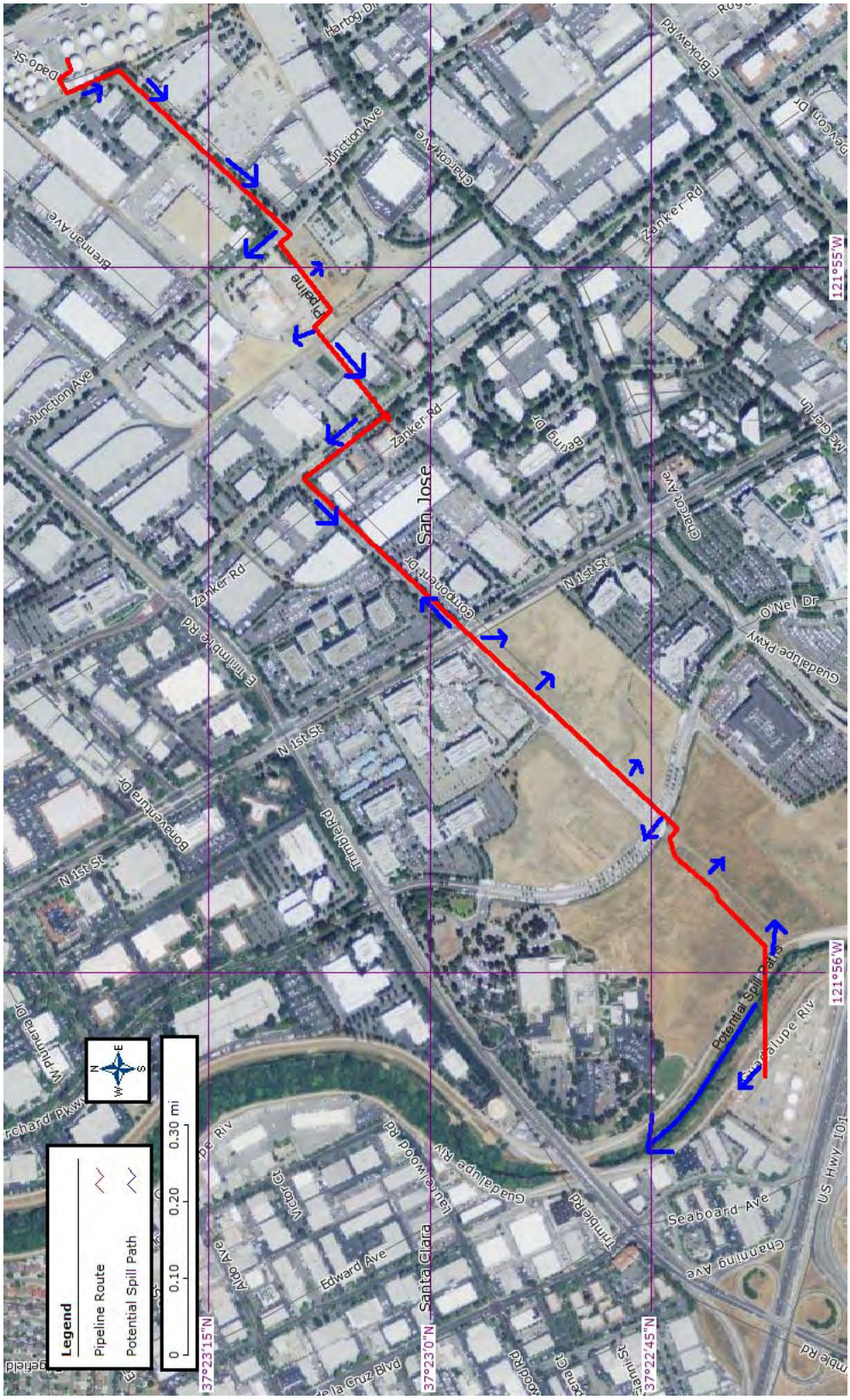


Figure A-2.2 Pipeline Map

ChevronTexaco

Material Safety Data Sheet

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

AVIATION TURBINE FUEL

Product Use: Fuel
Product Number(s):
CPS216100, CPS216101, CPS216103, CPS216111, CPS216140, CPS216150, CPS235611, CPS238142, CPS241078, CPS322001
Synonyms:
JET A, JET A-1, JET A-50

Company Identification
ChevronTexaco Global Aviation
a division of Chevron U.S.A., Inc.
1111 Bagby Street
Houston, TX 77002
United States of America

Transportation Emergency Response
CHEMTREC: (800) 424-9300 or (703) 527-3887
Health Emergency
ChevronTexaco Emergency Information Center: Emergency Information Centers are located in the USA. International collect calls accepted. (800) 231-0623 or (510) 231-0623
Product Information
Product Information: 510-242-5357 (USA)
MSDS Requests: 800-689-3998 (USA)

SECTION 2 COMPOSITION/ INFORMATION ON INGREDIENTS

COMPONENTS	CAS NUMBER	AMOUNT
Kerosine	8008-20-6	0 - 100 %weight
Kerosine, hydrodesulfurized	64742-81-0	0 - 100 %weight
Naphthalene	91-20-3	0 - 0.5 %weight
Ethylbenzene	100-41-4	0 - 0.5 %weight

SECTION 3 HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

- COMBUSTIBLE LIQUID AND VAPOR
- HARMFUL OR FATAL IF SWALLOWED - MAY CAUSE LUNG DAMAGE IF SWALLOWED
- MAY CAUSE RESPIRATORY TRACT IRRITATION IF INHALED
- CAUSES SKIN IRRITATION
- POSSIBLE CANCER HAZARD - MAY CAUSE CANCER BASED ON ANIMAL DATA
- TOXIC TO AQUATIC ORGANISMS

****

IMMEDIATE HEALTH EFFECTS
Eye: Not expected to cause prolonged or significant eye irritation.
Skin: Contact with the skin causes irritation. Symptoms may include pain, itching, discoloration, swelling, and blistering. Contact with the skin is not expected to cause an allergic skin response. Not expected to be harmful to internal organs if absorbed through the skin.
Ingestion: Because of its low viscosity, this material can directly enter the lungs, if swallowed, or if subsequently vomited. Once in the lungs it is very difficult to remove and can cause severe injury or death. May be irritating to mouth, throat, and stomach. Symptoms may include pain, nausea, vomiting, and diarrhea.
Inhalation: Mists of this material may cause respiratory irritation. Symptoms of respiratory irritation may include coughing and difficulty breathing. Breathing this material at concentrations above the recommended exposure limits may cause central nervous system effects. Central nervous system effects may include headache, dizziness, nausea, vomiting, weakness, loss of coordination, blurred vision, drowsiness, confusion, or disorientation. At extreme exposures, central nervous system effects may include respiratory depression, tremors or convulsions, loss of consciousness, coma or death.

DELAYED OR OTHER HEALTH EFFECTS:
Cancer: Prolonged or repeated exposure to this material may cause cancer. Contains ethylbenzene which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).
Contains naphthalene, which has been classified as a Group 2B carcinogen (possibly carcinogenic to humans) by the International Agency for Research on Cancer (IARC).

See Section 11 for additional information. Risk depends on duration and level of exposure.

SECTION 4 FIRST AID MEASURES

Eye: No specific first aid measures are required. As a precaution, remove contact lenses, if worn, and flush eyes with water.
Skin: Wash skin with water immediately and remove contaminated clothing and shoes. Get medical attention if any symptoms develop. To remove the material from skin, use soap and water. Discard contaminated clothing and shoes or thoroughly clean before reuse.
Ingestion: If swallowed, get immediate medical attention. Do not induce vomiting. Never give anything by mouth to an unconscious person.
Inhalation: Move the exposed person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention if breathing difficulties continue.
Note to Physicians: Ingestion of this product or subsequent vomiting may result in aspiration of light hydrocarbon liquid, which may cause pneumonitis.

SECTION 5 FIRE FIGHTING MEASURES

See Section 7 for proper handling and storage.

FIRE CLASSIFICATION:
OSHA Classification (29 CFR 1910.1200): Combustible liquid.

NFPA RATINGS: Health: 0 Flammability: 2 Reactivity: 0

FLAMMABLE PROPERTIES:
Flashpoint: (Tagliabue Closed Cup ASTM D56) 38 °C (100 °F) (Min)
Autoignition: 210 °C (410 °F)
Flammability (Explosive) Limits (% by volume in air): Lower: 0.7 Upper: 5

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide (CO2) to extinguish flames.

PROTECTION OF FIRE FIGHTERS:
Fire Fighting Instructions: For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
Combustion Products: Highly dependent on combustion conditions. A complex mixture of airborne solids, liquids, and gases including carbon monoxide, carbon dioxide, and unidentified organic compounds will be evolved when this material undergoes combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Protective Measures: Eliminate all sources of ignition in the vicinity of the spill or released vapor. If this material is released into the work area, evacuate the area immediately. Monitor area with combustible gas indicator.
Spill Management: Stop the source of the release if you can do it without risk. Contain release to prevent further contamination of soil, surface water or groundwater. Clean up spill as soon as possible, observing precautions in Exposure Controls/Personal Protection. Use appropriate techniques such as applying non-combustible absorbent materials or pumping. All equipment used when handling the product must be grounded. A vapor suppressing foam may be used to reduce vapors. Use clean non-sparking tools to collect absorbed material. Where feasible and appropriate, remove contaminated soil. Place contaminated materials in disposable containers and dispose of in a manner consistent with applicable regulations.
Reporting: Report spills to local authorities and/or the U.S. Coast Guard's National Response Center at (800) 424-8802 as appropriate or required.

SECTION 7 HANDLING AND STORAGE

Precautionary Measures: Liquid evaporates and forms vapor (fumes) which can catch fire and burn with explosive force. Invisible vapor spreads easily and can be set on fire by many sources such as pilot lights, welding equipment, and electrical motors and switches. Fire hazard is greater as liquid temperature rises above 85F.
Do not get in eyes, on skin, or on clothing. Do not breathe vapor or fumes. Do not breathe mist. Do not taste or swallow. Wash thoroughly after handling.
Unusual Handling Hazards: WARNING! Do not use as portable heater or appliance fuel. Toxic fumes may accumulate and cause death.
General Handling Information: Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.
Static Hazard: Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary but may not, by themselves, be sufficient. Review all operations which have the potential of generating an accumulation of electrostatic charge and/or a flammable atmosphere (including tank and container filling, splash filling, tank cleaning, sampling, gauging, switch loading, filtering, mixing, agitation, and vacuum truck operations) and use appropriate mitigating procedures. For more information, refer to OSHA Standard 29 CFR 1910.106, 'Flammable and Combustible Liquids', National Fire Protection Association (NFPA 77, 'Recommended Practice on Static Electricity', and/or the American Petroleum Institute (API) Recommended Practice 2003, 'Protection Against Ignitions Arising Out of Static, Lightning, and Stray Currents'.
General Storage Information: DO NOT USE OR STORE near heat, sparks or open flames. USE AND STORE ONLY IN WELL VENTILATED AREA. Keep container closed when not in use.
Container Warnings: Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly

returned to a drum reconditioner or disposed of properly.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS:
Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
Eye/Face Protection: No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
Skin Protection: Wear protective clothing to prevent skin contact. Selection of protective clothing may include gloves, apron, boots, and complete facial protection depending on operations conducted. Suggested materials for protective gloves include: 4H (PE/EVAL), Nitrile Rubber, Polyvinyl Alcohol (PVA) (Note: Avoid contact with water. PVA deteriorates in water.), Viton.
Respiratory Protection: Determine if airborne concentrations are below the recommended exposure limits. If not, wear an approved respirator that provides adequate protection from measured concentrations of this material, such as: Air-Purifying Respirator for Organic Vapors.
When used as a fuel, this material can produce carbon monoxide in the exhaust. Determine if airborne concentrations are below the occupational exposure limit for carbon monoxide. If not, wear an approved positive-pressure air-supplying respirator.
Use a positive pressure air-supplying respirator in circumstances where air-purifying respirators may not provide adequate protection.

Occupational Exposure Limits:

Component	Limit	TWA	STEL	Ceiling	Notation
Ethylbenzene	ACGIH_TLV	100 ppm	125 ppm		A3
Ethylbenzene	OSHA_PEL	100 ppm	125 ppm		
Kerosine	ACGIH_TLV	200 mg/m3			Skin A3
Jet Fuel	CHEVRON	350 mg/m3	1000 mg/m3		
Naphthalene	ACGIH_TLV	10 ppm	15 ppm		Skin A4
Naphthalene	OSHA_PEL	10 ppm	15 ppm		

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Attention: the data below are typical values and do not constitute a specification.

Color: Colorless to yellow
Physical State: Liquid
Odor: Petroleum odor
pH: NA
Vapor Pressure: 1 kPa @ 37.8°C (100°F)
Vapor Density (Air = 1): 5.7 (Approximate)

Boiling Point: 160°C (320°F) - 300°C (572°F)
Solubility: Low PPM range in water.
Freezing Point: -40°C (-40°F) (Max)
Specific Gravity: 0.81 @ 15.6°C (60.1°F)
Density: 0.75 - 0.84 g/ml @ 15°C (59°F)
Viscosity: 8 cSt @ -20.0 °C (-28.9 °F) (Max)

SECTION 10 STABILITY AND REACTIVITY

Chemical Stability: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Incompatibility With Other Materials: May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
Hazardous Decomposition Products: None known (None expected)
Hazardous Polymerization: Hazardous polymerization will not occur.

SECTION 11 TOXICOLOGICAL INFORMATION

IMMEDIATE HEALTH EFFECTS
Eye Irritation: The Draize eye irritation mean score in rabbits for a 24-hour exposure was: 0.0/110.
Skin Irritation: For a 4-hour exposure, the Primary Irritation Index (PII) in rabbits is: 5.5/8.
Skin Sensitization: This material did not cause skin sensitization reactions in a Buehler guinea pig test.
Acute Dermal Toxicity: 24 hour(s) LD50: >5g/kg (rabbit).
Acute Oral Toxicity: LD50: >5 g/kg (rat)
Acute Inhalation Toxicity: 4 hour(s) LC50: >5ml/l (rat).

ADDITIONAL TOXICOLOGY INFORMATION:
This product contains kerosene. CONCAWE (product dossier 94/106) has summarized current health, safety and environmental data available for a number of kerosenes (typically straight-run kerosene, CAS 8008-20-6, or hydrodesulfurized kerosene, CAS 64742-81-0). ACUTE/SUBCHRONIC: Following acute exposure to kerosene, signs observed in rats and rabbits were of a low order of toxicity: central nervous system depression occurred following oral exposure, skin irritation (ranging from slight to severe irritation) occurred with dermal exposure, and respiratory tract irritation occurred with inhalation exposure. None of the kerosenes tested produced more than slight eye irritation and none were skin sensitizers. However, intratracheal administration or artificial aspiration of small volumes (0.1 to 0.2 ml) of kerosene into the lungs of rats, chickens and primates resulted in lung damage and/or death. In a study in which rats, mice, rabbits and cats were exposed to kerosene aerosol concentrations in the range 0.05 to 120 mg/l for up to four weeks, reductions in respiratory rate, pulmonary hyperaemia, leucocytosis, monocytosis and decreased erythrocyte sedimentation rate were observed, and histological examination revealed inflammatory changes in the respiratory tract (tracheitis, bronchitis and pneumonia).
CANCER: Chronic (3 to 24 months) mouse dermal toxicity studies of kerosenes and jet fuels produced mild to moderate skin irritation, while long-term (2+ years) studies showed moderate to severe skin damage as well as an increased incidence of tumors after long latency periods (probably due to a secondary mechanism related to skin irritancy). DEVELOPMENTAL/REPRODUCTION: Hydrodesulfurized kerosene was tested by the Petroleum Product Stewardship Council in a OECD Guideline 421 Reproductive/Developmental Toxicity Study. The kerosene sample was diluted to 494 (60%), 330 (40%),and 165 (20%) mg/kg/day in food grade mineral oil and applied daily during pre-mating and mating to day 19 of gestation. There was no apparent maternal, reproductive, or developmental toxicity at any dose. Males treated for eight weeks had increased relative kidney weights in the high dose group but no microscopic changes in testes or epididymides. No gross anomalies were observed in the pups.

This product contains ethylbenzene. GENETIC TOXICITY: Ethylbenzene tested negative in the bacterial mutation test, Chinese Hamster Ovary (CHO) cell in vitro assay, sister chromatid exchange assay and an unscheduled DNA synthesis assay. Conflicting results have been reported for the mouse lymphoma cell

assay. Increased micronuclei were reported in an in vitro Syrian hamster embryo cell assay; however, two in vivo micronuclei studies in mice were negative. In Syrian hamster embryo cells in vitro, cell transformation was observed at 7 days of incubation but not at 24 hours. Based on these results, ethylbenzene is not expected to be mutagenic or clastogenic. CARCINOGENICITY: In studies conducted by the National Toxicology Program, rats and mice were exposed to ethylbenzene at 25, 250 and 750 ppm for six hours per day, five days per week for 103 weeks. In rats exposed to 750 ppm, the incidence of kidney tubule hyperplasia and tumors was increased. Testicular tumors develop spontaneously in nearly all rats if allowed to complete their natural life span; in this study, the development of these tumors appeared to be enhanced in male rats exposed to 750 ppm. In mice, the incidences of lung tumors in males and liver tumors in females exposed to 750 ppm were increased as compared to control mice but were within the range of incidences observed historically in control mice. Other liver effects were observed in male mice exposed to 250 and 750 ppm. The incidences of hyperplasia were increased in the pituitary gland in female mice at 250 and 750 ppm and in the thyroid in male and female mice at 750 ppm.

This product contains naphthalene. GENERAL TOXICITY: Exposure to naphthalene has been reported to cause methemoglobinemia and/or hemolytic anemia, especially in humans deficient in the enzyme glucose-6-phosphate dehydrogenase. Laboratory animals given repeated oral doses of naphthalene have developed cataracts. REPRODUCTIVE TOXICITY AND BIRTH DEFECTS: Naphthalene did not cause birth defects when administered orally to rabbits, rats, and mice during pregnancy, but slightly reduced litter size in mice at dose levels that were lethal to the pregnant females. Naphthalene has been reported to cross the human placenta. GENETIC TOXICITY: Naphthalene caused chromosome aberrations and sister chromatid exchanges in Chinese hamster ovary cells, but was not a mutagen in several other in-vitro tests.CARCINOGENICITY: In a study conducted by the National Toxicology Program (NTP), mice exposed to 10 or 30 ppm of naphthalene by inhalation daily for two years had chronic inflammation of the nose and lungs and increased incidences of metaplasia in those tissues. The incidence of benign lung tumors (alveolar/bronchiolar adenomas) was significantly increased in the high-dose female group but not in the male groups. In another two-year inhalation study conducted by NTP, exposure of rats to 10, 30, and 60 ppm naphthalene caused increases in the incidences of a variety of nonneoplastic lesions in the nose. Increases in nasal tumors were seen in both sexes, including olfactory neuroblastomas in females at 60 ppm and adenomas of the respiratory epithelium in males at all exposure levels. The relevance of these effects to humans has not been established. No carcinogenic effect was reported in a 2-year feeding study in rats receiving naphthalene at 41 mg/kg/day.

SECTION 12 ECOLOGICAL INFORMATION

ECOTOXICITY
The 7 day(s) EC50 for mysid shrimp (Mysidopsis bahia) is 1.19 mg/l.
This material is expected to be toxic to aquatic organisms.

ENVIRONMENTAL FATE
Ready Biodegradability:
This material is not expected to be readily biodegradable. The biodegradability of this material is based on an evaluation of data for the components or a similar material.

SECTION 13 DISPOSAL CONSIDERATIONS

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14 TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT Shipping Name: FUEL, AVIATION, TURBINE ENGINE
DOT Hazard Class: 3 (Flammable Liquid)
DOT Identification Number: UN1863
DOT Packing Group: III

SECTION 15 REGULATORY INFORMATION

SARA 311/312 CATEGORIES:

1. Immediate (Acute) Health Effects: YES
2. Delayed (Chronic) Health Effects: YES
3. Fire Hazard: YES
4. Sudden Release of Pressure Hazard: NO
5. Reactivity Hazard: NO

REGULATORY LISTS SEARCHED:

4_I1=IARC Group 1	15=SARA Section 313
4_I2A=IARC Group 2A	16=CA Proposition 65
4_I2B=IARC Group 2B	17=MA RTK
05=NTP Carcinogen	18=NJ RTK
06=OSHA Carcinogen	19=DOT Marine Pollutant
09=TSCA 12(b)	20=PA RTK

The following components of this material are found on the regulatory lists indicated.

Ethylbenzene	15, 4_I2B
Kerosine	17, 18, 20
Kerosine, hydrodesulfurized	17, 18, 20
Naphthalene	15, 16, 17, 18, 20, 4_I2B

CERCLA REPORTABLE QUANTITIES(RQ)/SARA 302 THRESHOLD PLANNING QUANTITIES(TPQ):

Component	Component RQ	Component TPQ	Product RQ
Naphthalene	100 lbs	None	20000 lbs
Ethylbenzene	1000 lbs	None	200000 lbs

CHEMICAL INVENTORIES:
UNITED STATES: All of the components of this material are on the Toxic Substances Control Act (TSCA) Chemical Inventory.
CANADA: All the components of this material are on the Canadian DSL or have been notified under the New Substance Notification Regulations, but have not yet been published in the Canada Gazette.

WHMIS CLASSIFICATION:
Class B, Division 3: Combustible Liquids
Class D, Division 2, Subdivision A: Very Toxic Material - Carcinogenicity
Class D, Division 2, Subdivision B: Toxic Material -

Skin or Eye Irritation

SECTION 16 OTHER INFORMATION

NFPA RATINGS: Health: 0 Flammability: 2 Reactivity: 0

(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT: This revision updates the following sections of this Material Safety Data Sheet: 1 - 16.

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

TLV	-	Threshold Limit Value	TWA	-	Time Weighted Average
STEL	-	Short-term Exposure Limit	PEL	-	Permissible Exposure Limit
			CAS	-	Chemical Abstract Service Number
NDA	-	No Data Available	NA	-	Not Applicable
<=	-	Less Than or Equal To	>=	-	Greater Than or Equal To

Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the ChevronTexaco Energy Research & Technology Company, 100 Chevron Way, Richmond, California 94802.

The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modifications of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

APPENDIX C

CONTAINMENT PROCEDURES

APPENDIX C CONTAINMENT PROCEDURES

CONTENTS

C.1 Containment Booming (Calm Water)

Application: Applicable to inland and/or open water situations with minimal wind and currents and adequate depth.

Equipment: This section refers to application of conventional or "hard" boom. See C.5 for use of sorbent boom. Conventional booms may be divided into several categories including:

- Skirt or curtain boom. (A weighted curtain that hangs below a flotation chamber. Appropriate for general application)
- Fence boom (Equipped with a curtain below the water and a vertical fence above the water. Used primarily for permanent installations, or quiet water. May have streamlined or “outrigger” flotation. Not stable in higher currents and has poor shore-sealing characteristics.)
- Bottom tension boom (Have a tension cable or chain at the bottom of the curtain to improve stability in higher currents)
- Self-inflating boom (Compactly stored boom that fills with air when deployed. Some types require constant compressed air supply. Appropriate for quick deployment and short-term installation.)
- Specialty boom
    - o Shore seal boom (Uses a water filled lower chamber instead of a curtain. Stable and surface conforming. Used for intertidal areas and wetlands / mudflats.)
    - o Fire boom (Constructed of fire resistant materials or containing a water spray system. Difficult to deploy and expensive.)
    - o High current boom (Mostly experimental types designed to operate in high current regime.)
- Improvised boom (Boom constructed of locally available materials such as logs. Application generally limited to low energy conditions.)

In general, booms having solid flotation are preferred over those having pneumatic flotation or loose materials. "Self-expanding" boom is acceptable for short-term deployment, but should be replaced with more durable equipment for longer-term installations (more than several days). Booms should be sized to match the nature and access requirements of each particular application.

Limitations: Applicable to floating oil only. Effectiveness of conventional booms is limited by factors including currents and waves.

Entrainment (loss) of oil under a boom will begin to occur in the presence of currents exceeding approximately 1.0 knots perpendicular (normal) to the plane of the boom. Splash-over (and resultant loss of oil) may occur in the presence of waves large enough to overtop the boom. Boom effectiveness may also affected in water too shallow to allow full deployment of the boom skirt, or across shorelines or irregular surfaces. Booms will also fail when they have exceeded their containment capacity (too much oil) and drainage under the boom occurs.

Deployment Instructions:

General Order boom appropriate for specific conditions encountered. The wrong boom may not work, and you will probably be charged for it whether it is used or not. Setup a tracking system to log in all boom that arrives at the spill scene by type, quantity and supplier. An inventory system will greatly simplify damage and use issues later in the response.

Open Water Deployment: Position the boom deployment boat along the downwind side of the slick or point of entry into a water body. Anchor one end of the boom or attach to a second boat or drogue. Tow or deploy boom around leading edge of slick, forming a curve or centenary in which the oil can collect in its apex. Make sure that boom is positioned to catch oil moved by winds and currents. Anchor end of boom or hold in place with boat as shown in Figure C.1a.

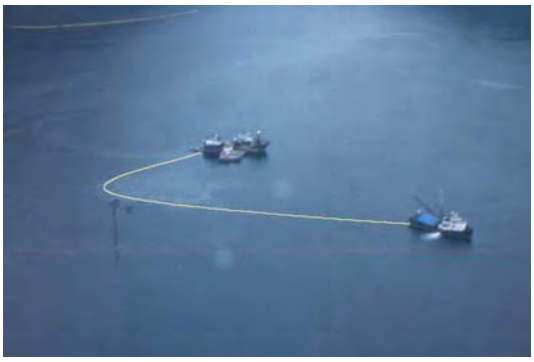


Figure C.1a Open water Containment

Inshore Booming - Oil Entering Open water: If deploying from a shoreline, attach one end of boom to a solid anchor point (Do not attach to fences, utility lines, or other features that can be damaged). Tow or pull free end of boom across leading edge of slick to desired location and anchor as shown in Figure C.1b.

Figure C-1b Containment at Stream Mouth

A line throwing gun may be used instead of a tow boat. Examine the deployment to ensure that you have a good seal between the boom skirt and the bottom where it crosses the

shoreline. If necessary, the boom shirt may be buried or sand bagged across this area. Specialized booms which have bottom-chambers filled with water (intertidal boom, Figure C.1c) are available for shoreline crossing and other shallow water applications

Figure C.1c Intertidal Boom

Shoreline Booming - Containment of Oil Already On Shoreline: In cases where oil has already impacted shorelines, it may be desirable to keep the oil in place until it can be recovered. In this situation, anchor shallow draft boom at sufficient distance below the intertidal zone so that boom will float correctly at low tide, as indicated in Figure C-1d. Posts or pipe may be used to hold the boom in location. Sorbent, sorbent boom or sorbent sweep may be placed inshore of the boom to trap floating material, and/or placed on oil in the intertidal zone.

Figure C.1d Containment of Oil on Shoreline

Maintenance: All booms are subject to movement in response to changes in wind, currents, tidal variations (as shown in Figure C.1e), and anchor dragging. Boom deployments must be inspected on a frequent and regular basis, and adjusted as necessary to maintain proper configuration. In addition, collected fluids and debris must be periodically removed or boom failure will occur. Finally, all booms are subject to mechanical damage and must be inspected and repaired (or changed out) as necessary.

Figure C.1e Boom at Low Tide
(Courtesy Clean Bay Inc.)

Demobilization:
Booms that have been exposed to oil will require decontamination. Soiled boom should be towed to a truck access area for recovery. Booms can be decontaminated on site if a field decontamination station has been established. It not, contaminated boom can be hauled to a designated Decontamination Station using lined trucks. After decontamination, boom should be

inspected, repaired as necessary, dried and returned to storage.

Variations:

In general, floating booms will not be effective in containing heavy or neutrally buoyant oil, unless the boom skirt extends all the way to the bottom, and there is no current. Siltation booms used for construction have skirt depths of up to 10 feet and may extend the depth to which sinkers and neutral oils may be contained (Applicable only where no currents are present)..

C.2 Containment Booming in Flowing Water

Application: Applicable to most coastal situations involving tidally influenced waters.

Equipment: Booms deployed in flowing water will be subject to high loadings and must be more durable than typical calm water harbor boom. Desirable features include cable or chain tension members, weighted skirts, and streamlined profiles. Fence booms, self-expanding booms, and booms with outrigger flotation should be avoided.

Limitations:

Applicable to floating oil only. All booms are subject to the same hydrodynamic phenomena and will begin to fail at current velocities exceeding approximately 1 knot normal (perpendicular) to the boom. However, the velocities at which effective booming may be accomplished can be extended by deploying the boom at an angle to the current.

Oil encountering the boom will be deflected along the boom to the shoreline. Accumulated oil must be removed as it is collected or leakage will occur. Because of this, multiple boom deployments are commonly used in high flow areas.

In addition, flowing water can place significant stress on boom sections. Additional anchor points may be required to hold the boom in position, and deployment of long sections of boom should be avoided. All boom connectors should be compatible. Booms constructed of durable materials and having a cable or chain tension member are preferred for application in currents and areas where debris loadings are high.

General Instructions:

Streams: Determine optimum deployment location (minimum velocity and access for deployment and collection of contained oil. Boom may be deployed directly across the stream, or diagonally as shown in Figures C.2a (Deployment for tidal situations shown – two collections points).

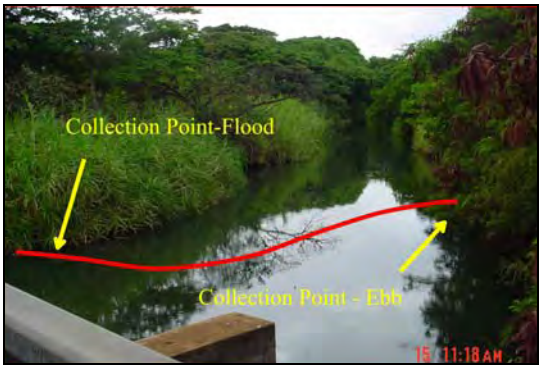


Figure C.2a Single Boom – Tidal Situation

In Figure C.2b, two booms are deployed in a non-tidal environment

to improve the effectiveness of the containment. As in the previous case, angle the boom toward an accessible collection point. Sorbent boom has been deployed down-current to recover any leakage.

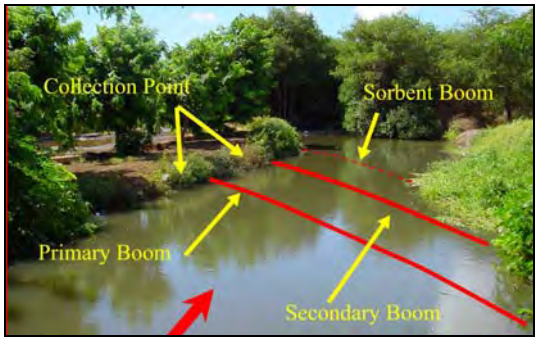


Figure C.2b Double Boom – Non-tidal Situation

Diagonal deployment is preferred as it is effective under higher flow conditions, and will direct oil to the shoreline where it will concentrate and can be recovered. If possible, locate downstream end of boom (collection point) at an accessible location. For open water deployments, boom is deployed between two anchor points of boats, and oil collects in the boom centenary. For any deployment, oil must be removed as it is collected or it will accumulate to the point where boom failure occurs

If anchors are used to hold the boom in place, set them before deploying boom. Use the currents to assist in the streaming and placement of the boom (tows into the current and allow the boom to fall back across the stream, rather than attempt to pull it directly across the current). The optimum deployment angle depends on current velocity, boom length, and boom stability. Figure C.2c can be used to determine maximum boom angle versus current.

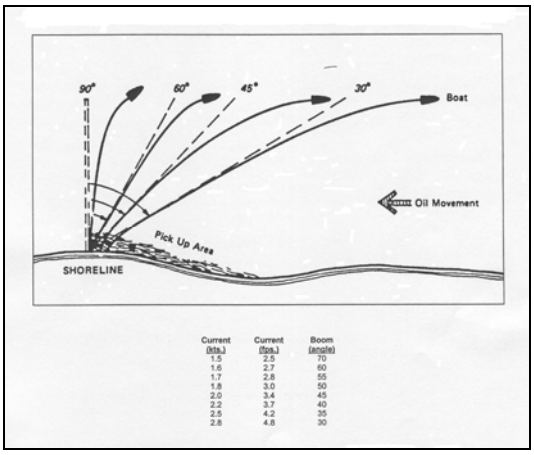


Figure C.2c Boom Angle vs. Current

In general, boom length should be four times the width of the waterway. As current velocity and boom length increase, the deployment angle relative to the shoreline decreases. To improve boom stability, it may be necessary to anchor it in several places. In situations where currents exceed 1.0 knot, multiple containment boom deployments may be advisable.

Anchoring: Booms may be attached to any suitable fixed object along the shoreline, or in the absence thereof, attached to a buried log (dead man)

Anchor requirements in open water are dependent on factors including current speed, tides, boom loading, and bottom type.

Use of double anchors improves performance and facilitates recovery of the primary (usually the largest) anchor. Typical double anchor configuration is shown in Figure C.2d.

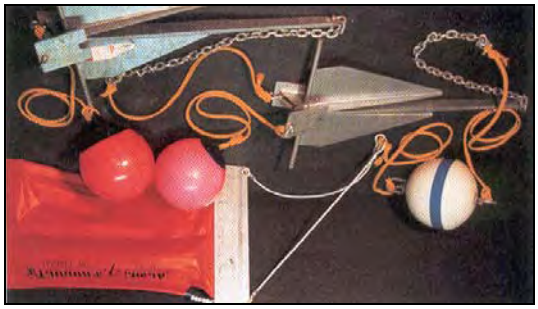


Figure C.2d Double Boom Anchors

Shoreline Termination: Typical skirt boom will not make a complete seal with the shoreline, and oil loss can be expected. Several methods can be utilized to reduce shoreline oil loss. The boom skirt can be buried across the shore zone or water level variations, or the boom can be sealed with sand bags, as shown in Figure C.2e

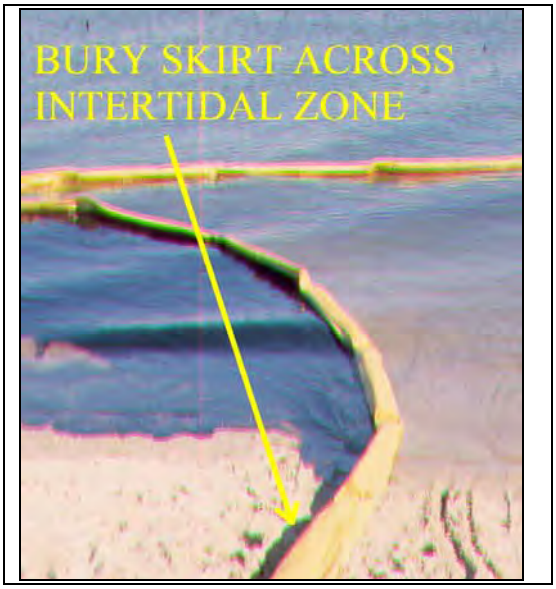


Figure C2e Shore Sealing By Burying Boom Skirt

With high slope or hard shorelines, any gaps can be plugged with sorbent materials, such as snare, or sand bags, as indicated in Figure C.2f.

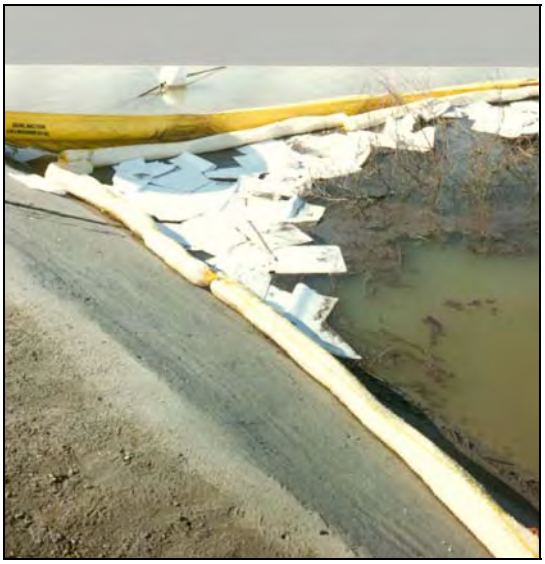


Figure C.2f Shore Seal by Plugging Gap With Sorbent
(Courtesy Clean Bay Inc)

Maintenance:

To prevent boom damage, constant inspection and removal of accumulated debris is necessary. Oil must also be periodically removed from the downstream end of the boom by skimming, pumping, or using vacuum trucks. A containment pit dug into the shoreline can expedite the containment and recovery process. Periodically check the boom for leakage and adjust its placement angle, if necessary. Also check the boom for twisted, damaged, or

submerged sections. Check anchors for security.

Demobilization:

Remaining sheens may be recovered with sorbents. Booms should be removed and transported to a decontamination area for cleaning and repairs. Refer to Appendix D for shoreline cleanup methods.

Variations: For wide rivers, deploy two or more booms from each bank with one positioned slightly downstream from the other. Anchor the free ends so that they overlap slightly past the midstream point. If not enough boom is available for multiple deployments, place available boom to collect oil where debris collects naturally.

C.3 Fast Water Booming

Application: Floating oil only. Any situation where currents may exceed 2 to 3 knots, such as in intake / discharge structures and streams during high flow. Containment booming in high current situations is, at best, only partially effective and multiple deployments are normally required to achieve acceptable control. Following discussion does not include experimental equipment or techniques.

Limitations:

Control of floating oil under high current conditions is difficult at best. Incomplete containment at any individual deployment can be expected, and use of multiple sequential deployments may be necessary for adequate control.

General Instructions:

Three general rules apply to fast current booming. First, deployments should be diagonal across the stream, with as low an angle to the current flow as possible, to minimize forces on the boom and probability of oil entrainment under the boom. Second, deployment must work with the current. Attempts to deploy boom against high current will generally be unsuccessful. Third, oil will be directed to a collection point where it must be remove as rapidly as possible.

Boom having bottom tensioning cables or chains is preferred. A specialized fast water boom is shown in Figure C.3a

Figure C.3a Fast Water Boom
(Courtesy Clean Bay Inc)

Deployment: A deployment diagram is shown in Figure C.3b.

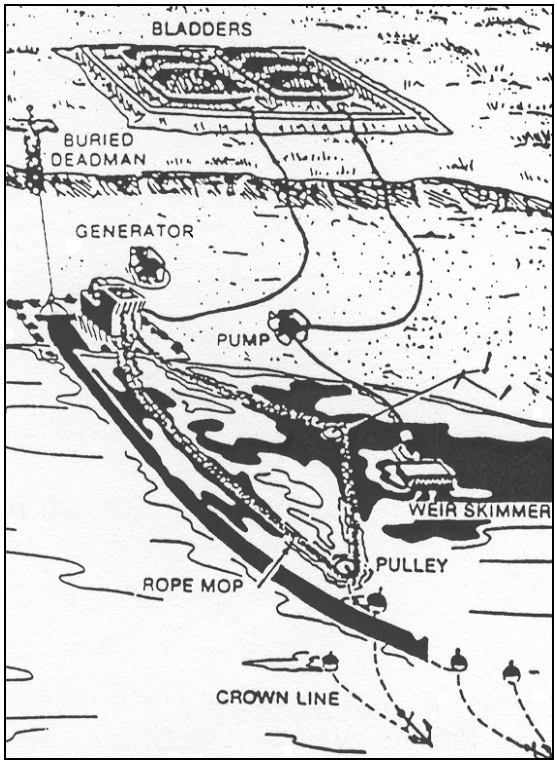


Figure C.3b Diversion Booming In Current

Determine and preferably set boom anchor(s) before deploying the boom. Attach the boom to the upstream anchoring point. To facilitate boom deployment, extend the boom upstream from the anchoring point on the shoreline (if possible) or tow the boom directly into the current next to the shoreline, to its maximum extent. Have a line attached to the boom for connection to the downstream anchoring point. Work the boom into the current and to the opposite side as rapidly as possible, allowing for downstream drift. Attach to the downstream anchoring point as quickly as possible. Depending on stream width, it may be necessary to use midstream anchoring points as follows: Tow the boom directly into the current and across it diagonally downstream, but not directly across it or diagonally across it upstream. If oil is being diverted to the shore, angle the boom's free end toward the oncoming oil (upstream). The apex of the boom should be located where there is vehicular access to facilitate accumulated oil and debris recovery. Locate the shoreline termination point at a natural collection point. Natural collection points can be identified by accumulation of debris or watching the movement of floating materials. If oil is being diverted away from the feature, the shore termination should be upstream of the feature, and the boom angled downstream.

The optimum angle of boom deployment is dependent on the type, length, and current velocity as shown in Figure C.3c.

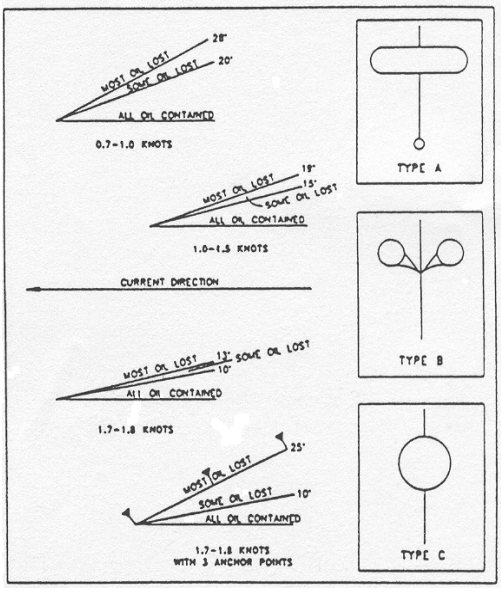


Figure C.3c_ Relationship of Boom Deployment Angle to Current Velocity.

Generally, the angle of the boom to the shoreline must be decreased as current velocity increases. A similar relationship is true with regard to boom length.

Performance of long diversion booms can be improved, however, through use of additional anchoring points or a cascading configuration, such as shown in Figure C.3d.

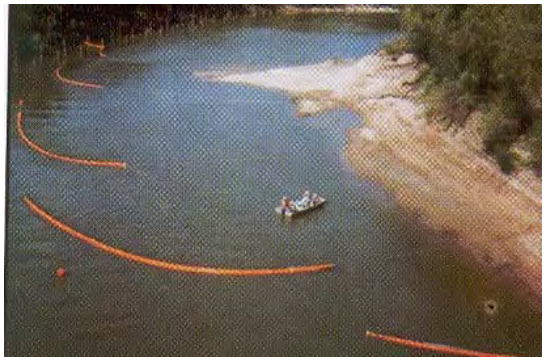


Figure C-3d. Cascade Booms in High Current

Shoreline Termination

Bury end of boom or seal termination point with sorbent as described in Section C.2.

Sumps Holding capacity of the diversion structure can be enhanced by digging a sump in the shoreline, upstream of the boom termination point. (Pile excavated material on the backshore so it does not become contaminated.

Maintenance:

Diversion booms are subject to mechanical damage, twisting and fouling, particularly in tidal situations or where wind shifts alter slick movement. Deployments should be checked periodically (at least several times per day) for correct deployment and/or damage and reset or repaired as necessary. When used in the collection mode, collected material must be removed on a regular basis.

Demobilization:

Remove boom and other equipment to decontamination area for cleaning and repair. Remove or treat oiled beach materials and fill in the sump.

Variations:

In areas of high current velocity or high oil loadings, it may be desirable to install multiple sets of boom such as shown in Figure C.3e.

Figure C.3e. Multiple Boom Deployment

A series of boom sections may be deployed in sequential or cascading diversion configuration in situations where forces on a continuous length of boom may exceed its breaking strength or anchor holding capacity. Cascading booms are used to direct floating oil toward a collection point or away from a sensitive feature.

Deflection Away from Feature: Set anchors before deploying boom, working from upstream to downstream. Connect the lead (up current) boom section to its upstream shore or anchor point first. Tow the boom directly into the current to its full length, and the angle toward its downstream anchor point, working with the current, and attach. Repeat with each boom segment until feature to be protected is by-passed. Amount of boom overlap will depend on local conditions (20% overlap suggested for initial application).

C.4 Exclusion Booming

Objectives:

Booms are deployed to prevent floating oil from reaching sensitive features.

Limitations:

To be effective, booms must be deployed before arrival of oil. Accessibility, adequate water depth for effective boom placement, wave action, and current velocities also limit effectiveness of the technique.

General Instructions:

Place booms across the area to be protected and anchor both ends to the shore. A typical installation protecting a wharf is shown in Figure C4a (This figure also depicts containment booming).

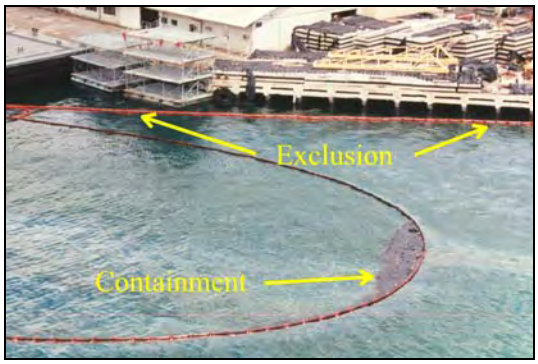


Figure C4a Exclusion Booming

For inlets or marinas, booms should be placed inside the openings where currents velocities and wave action are lowest. Currents tend to be higher in these areas, and backup booming may be appropriate. In addition, measures taken outside of the exclusion zone (diversion away from the area or diversion to a shoreline recovery point) may be appropriate for protection of particularly sensitive areas.

To maintain boom integrity, anchors should be placed at 100 foot intervals if substantial lengths are required. High wind and wave conditions may necessitate use of additional or heavier anchors.

Maintenance:

Check boom periodically for position, leakage, and/or twisted, broken or submerged sections. In tidal waters or areas with fluctuating water levels, reposition the boom and/or anchor points as water levels change.

Demobilization:

Remove oiled boom to decontamination station for cleaning and repair. Remove attachment points and any contaminated soil or sediment. Return all excavations to original grade.

Variations:

Double or triple booming may be employed in areas with high currents or unusual sensitivity. Exclusion booms may also be constricted out of locally available materials such as logs connected by a cable.

C.5 Sorbent and Sorbent Booms

Objectives:

Commercial sorbent booms can be used to contain and recover oil floating on any water depth. Sorbent booms can also be used to improve the performance of conventional booms by catching oil which is entrained by currents, over splash, or bleed through connectors. Other sorbent materials and configurations are available for special applications and control and cleanup of spills on land.

Limitations:

Application of sorbent boom is generally limited to very quiet water conditions. Sorbent type and configuration should be matched to oil type and environmental conditions for optimum performance (see guidelines below). Experience has shown that snare and snare sweeps are generally most effective with viscous oil. Sorbents will typically become waterlogged and may sink and/or loose effectiveness. Maximum recovery requires periodic turning of the sorbent to expose clean areas. Sorbent effectiveness may be diminished or completely lost in the presence of surfactants (dispersants, detergents and other surfactants).

General Instructions:

Sorbent Materials: Sorbents are constructed of a variety of materials Including polyurethane, polyethylene, and a variety of natural organic materials. Some of these materials are biodegradable (for practical purposes, it is seldom possible to recover 100% of the sorbent materials deployed), and some may be recycled. Sorbents utilizing plastic mesh backing should be avoided in that the backing may present an environmental hazard if the spent sorbent is not recovered. In general most sorbents will require handling and disposal as waste.

Configurations: Select appropriate type and sorbent configurations for the desired application. Sorbent materials are available in configurations including:

- Sorbent Booms: Sorbent materials enclosed in mesh bags. Typically have a rope Strengthening member and snap connectors.
- Pads: Typically 18 x 18 inch pads, useful for general cleanup operations, including land.
- Rolls: Generally made of the same materials as pads, but supplied in long rolls. Useful for light open water oil collection, land cleanup, and for protection of work areas, decontamination Stations, etc.

- Sweeps: Typically consist of sorbent pads connected at intervals to a rope. Generally used between two boats or points to "sweep: an area during final stages of cleanup.

- Snare: Mop-like fibers. May be single units or attached to handles. Effective in heavy oil.

- Snare Sweeps A series of snares connected to a rope. Can be used to "sweep" areas during final cleanup, or deployed along shorelines for protection of prevention of re-contamination in the case of existing oiling.

- Pillows: Pillow-shaped mesh bags of loose sorbent

- Granular (loose) Loose sorbent offers large surface area, but is difficult to collect after it is broadcast applications are generally to land where control is easier. Loose sorbent may also be used to immobilize oil, restricting its movement through the environment (including penetration into sediments).

Containment / Recovery (water): Lengths of sorbent boom (sausage) are commonly connected together to form barriers across waterways or for deployment along shorelines, piers, docks, etc. Deployment procedures are similar to those describe for conventional booms, although the anchoring requirements are less demanding. See Figure C.5a.

Figure C.5a Sorbent Boom

Sorbent boom connections typically do not provide good seals, and overlapping boom sections is recommended. Sorbent booms require continual maintenance, including repositioning and turning to expose clean surfaces, and must be replaced when they are either oil and/or water saturated. For heavy oil, sweeps constructed of snare are typically more effective than sorbent boom, and are recommended for general application for on-water use.

Containment / Recovery (Land): Roll sorbent, pads and loose sorbent have been used successfully on land for control and recovery of spilled oil. Roll sorbent can be applied to impound oil on very shallow water or areas of overland flow of oil as suggested in Figure C.5b.

Figure C.5b Roll Sorbent

Secondary Control: Sorbent materials can find a variety of secondary applications during spill response. Included are use of sorbent booms and other configurations to recover oil lost during conventional control operations. An example of secondary sorbent use is shown in Figure C.5c where a snare sweep is used behind sorbent boom for shoreline protection

Figure C.5c Double Sorbent Booming

Other uses have ranged from protection of shorelines and backshore areas from both spray and work activities, as shown in Figure C.5d and C.5e.

Figure C.5d Shoreline and Backshore Protection

Figure C.5e Protection of Decon Area

Maintenance:

Most sorbent materials tend to lose effectiveness when their surfaces are coated with oil. Turn booms or sorbents regularly for maximum absorbency and replace them when they are completely saturated with oil, sediment, or water. Check booms and barriers periodically for proper positioning, exhaustion, water saturation, and/ or damage.

Cleanup:

Segregate spent sorbent in the field (bag separately from other

materials). Oil in sorbent materials can warm and become mobile if warmed in the sun, and can contaminate other areas. Store used sorbents in leak-proof containers and inside a secondary impoundment pending removal for recycling or disposal..

Variations:

Soil, sawdust and other common materials have excellent sorbent qualities, and are acceptable for land application in emergencies. Oil saturated materials must ultimately be collected and treated, so application of sorbent, commercial or improvised, should consider alternatives and economic advantages and disadvantage

C.6 Filter Barriers

Objectives:

Filter barriers are designed to allow the passage of water while retaining oil. They are intended to be rapidly constructed in remote areas and have application in smaller streams and creeks, and in the control of overland flow of oil and oil/water mixtures.

Limitations:

Applications of filter barriers are limited to conditions of relatively low flow.

General Instructions:

Water Applications: Filter barriers utilize nets or fencing to impound sorbent materials. The floating oil is trapped by the sorbent, and the water is allowed to pass through or under the structure. Barriers are typically constructed using nets, fencing or other structures stretched across the stream to be controlled. Fencing is bent at the bottom to conform to the shape of the channel. Nets should be weighted down with rocks. The sorbent material is placed up stream from the net or fencing and allow to collect on its upstream side (material must be coarse enough to be retained on the net or fence). Properly constructed, the sorbent will float up and down, adjusting to water level variations. Typical installations are shown in Figures C-6a and C-6b, for one direction of flow and tidal flow, respectively. Wooden stakes or metal fence posts are added at intervals for support. If necessary, rope or cable can be used to re-enforce the application.

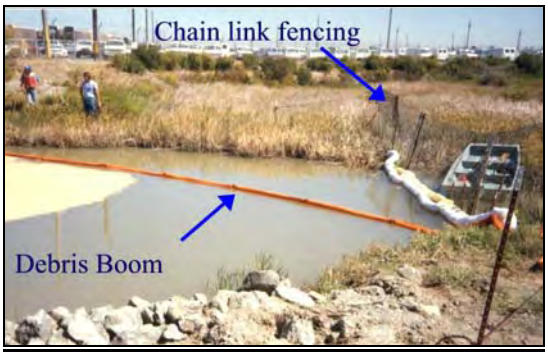


Figure C.6a Filter Fence – One Direction of Flow

Figure C.6b Filter Fence – Tidal Flow

Straw or hay bales are commonly available and can be used intact as filter barriers in shallow water. Figure C.6c shows the use of straw bales to protect a tidal inlet. Bales should be wired together and staked to the ground to prevent movement.

In this case, the installation has been augmented with the use of conventional sorbent boom.

Figure C.6c Hay Bale Barrier

Land Applications: Filter barriers may also be effective on land. These barriers are based on erosion control technology, and commonly utilize straw or hay bales. A typical installation is shown in Figure C.6d. As for water applications, the bales should be wired together and staked to the ground.

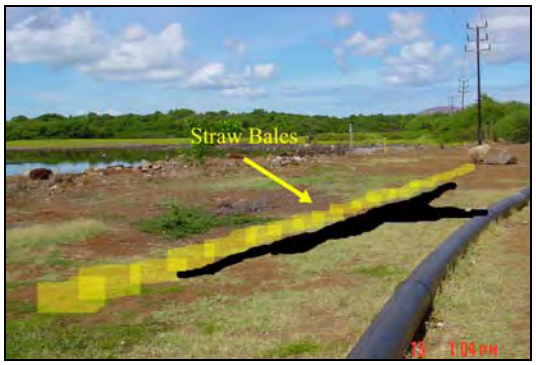


Figure C.6d Straw Bale Filter Barrier

Straw bale barriers may also be installed on low to moderate slopes. Where slopes are excessive, it may be desirable to set bales in shallow trenches to keep them from moving downslope.

Maintenance:

Filter barriers must be inspected frequently to ensure that sorbent placement is adequate. If the filter medium shifts, oil may pass directly through the barrier. The sorbent material must also be inspected for saturation, either with oil, or water. Water saturated sorbent will tend to sink and loose effectiveness (this is particularly true with respect to straw which tends to become water saturated very rapidly).

Demobilization:

All barrier components should be removed after completion of the cleanup. Clean and undamaged materials may be recycled, and other components must be properly handled and disposed.

Variations:

A variety of sorbent materials may be used for water applications. Straw is generally acceptable (and available) for land applications, but may be difficult to recover on water. In tidal areas, it is generally necessary to add a screen on the uphill side of the barrier, to allow it to retain its sorbent during incoming tide.

C.7 Berms, Trenches and Dams

Objectives:

Berms and dams are constructed on site (typically with earth or sediment) to contain spilled oil in low areas or to direct oil to a collection point or away from a sensitive area. Trenches are constructed to intercept oil and channel oil to concentration and collection points, and can be used in conjunction with berms and dams.

Limitations:

Both berms, dams and trenches are limited in capacity by their size. In addition, Berms and dams may have limited structural capacity and may fail if too much oil is impounded or if they are exposed to wave action or high currents.

General Instructions:

Shorelines
Berms, dams and trenches may be constructed using equipment ranging from shovels to heavy construction equipment (motorgraders, backhoes, etc,). The type of equipment is dependent on size and length of the berm or trench required, and availability of appropriate equipment.

If heavy equipment is unavailable, shovels may be used to construct berms, The borrow area for berm material should be from inland side of the berm (burial of oil and sediment may occur if the borrow ditch is seaward). In some cases it may be appropriate to use shoreline berming with collection trenching.

Earth and/or sandbag berms can used to protect wetlands and small waterways as shown in Figure C.7c.

Figure C.7c. Earth Berm Across Wetland Channel

Any berms constructed in wetland areas must consider the potential impacts of interfering with water circulation and tidal flow.

Inland

Dam locations should have high banks on the upstream side with the dam well-keyed into the banks. Construct the dam using on- or near-site earthen materials, such as sandbags, plywood sheets, or any material that blocks the flow of oil. Excavate earthen materials from the upstream side to increase storage capacity. Oil is recovered from behind the dam by pumping or using vacuum trucks. Plastic sheeting should be placed over the dam to prevent oil leakage and erosion of

dam components. Figure C7.d depicts a simple drainage ditch dam.

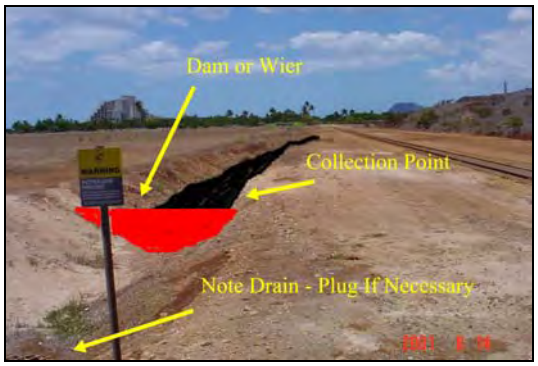


Figure C.7d Drainage Ditch Dam

Figure C.7e depicts damming of a release along a road drainage and an agricultural irrigation canal.

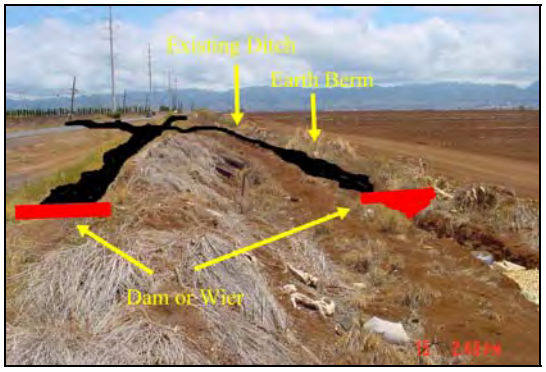


Figure C.7e Damming of Road Drainage and Irrigation Canal.

Berms may also be used inland to direct and contain oil flow. Lighter equipment (backhoe, manual labor) is generally used to construct berms inland, When used to direct flow, position the berms to divert the oil to a natural depression, excavation, or collection area. Berm material should be borrowed from a trench on the uphill side of the berm. A typical diversion and containment berm sequence is shown in Figure C.7f.

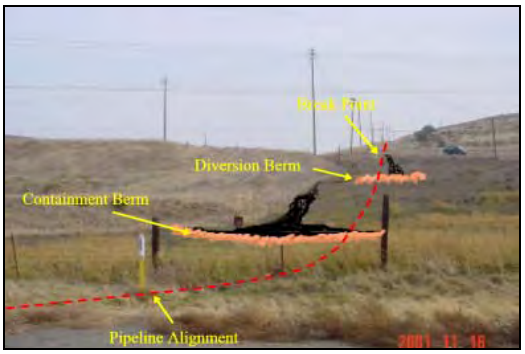


Figure C.7f Diversion / Containment Berms

Berms may also be constructed using sandbags. Figure C.7g shows a typical sandbag berm which has be designed to contain oil flowing into a stream from a small tributary.

Figure C.7g Sandbag Diversion Berm

Maintenance:

Berms and dams should be inspected on a regular basis and repaired or reinforced as necessary. Debris accumulations may result in failure of the berm / trench system and should be removed periodically.

Demobilization:

Contaminated soil should be removed and properly disposed of. All trench installations should be inspected for presence of buried oil (particularly coastal installations), and contaminated materials removed. All cleaned areas should be graded and compacted to original contour, and re-vegetated, if necessary.

Variations:

Berms and dams may be constructed with sand bags or re-enforced with planks, Berms so constructed will typically last longer and perform better in high energy situations (waves, high flow, etc.). If time and materials permit, installation of plastic sheet on berms and in trenches will reduce soil contamination and demobilization cleanup requirements. Berms may also be used in diversion or cascading configurations.

C.8 Weirs

Objectives:

Wiers and flowing water dams are constructed across culverts, ditches, and shallow streams to contain floating oil while not obstructing the water flow. Flowing water dams and weirs are also used to raise water levels, preventing penetration of oil into sediments, and improving recovery operations.

Limitations:

Accessibility, implementation time, availability of dam materials, water depth, and high flow/ current velocities.

General Instructions:

Flowing Water Dams Dam locations should have high banks on the upstream side with the dam - well-keyed into the banks. Construct dam with on- or near-site earthen materials, such as sandbags, plywood sheets, etc. Use heavy equipment or manual labor to excavate materials from the upstream side to increase dam storage capacity. Plastic sheeting may be used to make the upstream side impermeable, thereby reducing eventual cleanup requirements. Flowing water dams utilize inclined or valved pipes that have a flow capacity greater than the stream flow rate. Use of valves allows water level to be easily adjusted as flow conditions change. To install a valved system, place the valved pipe(s) just above the streambed with the valve(s) downstream, and construct the dam on top. Adjust the valve opening(s) until the desired water level is achieved behind the dam. If valves are not available, placed pipes in the dam during construction. The pipes should be inclined with the low end upstream, and the high end downstream. The height of the raised end of the pipe determines the water level behind the dam. As an alternative, the pipe(s) may be installed horizontally at the desired water level, and an elbow and extension added to the upstream end of the pipe to exclude oil. This configuration is shown in Figure C.8a. Note that some oil may be lost until the discharge pipe(s) are submerged.

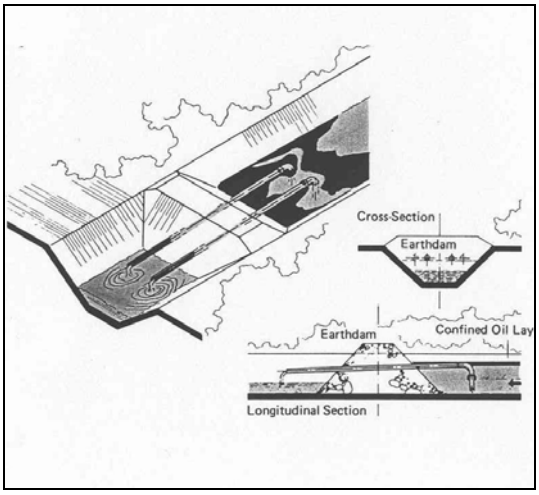


Figure C.8a Earthfill Underflow Dam (Concawe, 10/83)

Alternate materials may be used to construct weirs. Figure C.8b and C.8c show weirs constructed from wooden planks and sandbags, respectively.

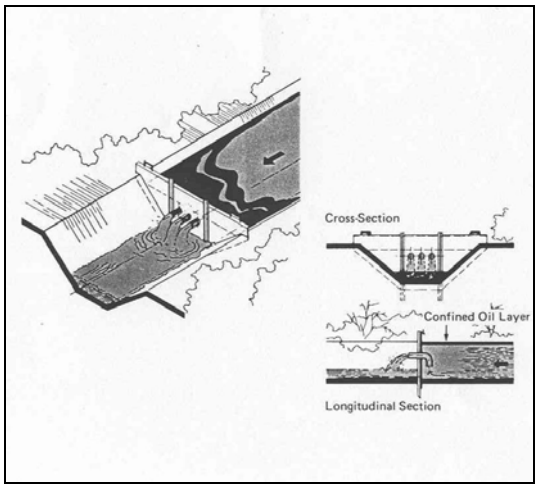


Figure C.8b Wooden Underflow Dam Concawe, 10/83)

Figure C.8c Sandbag Underflow Dam

In Figure B.8b, pipes have been installed mid depth in a wooden dam. Note that the pipe capacity is slightly less than the stream flow, causing the water level behind the dam to be slightly higher that the pipe elevation. If stream flow increases, the water level will continue to rise, and overtopping could occur. Designing the system with excess pipe capacity is generally preferred. Pumps or siphons can also be used to pass water over the dam.

Weirs: Two types of weir configurations are possible, underflow and overflow. Underflow weirs are simply barriers across the upper portion of the water column that impound floating oil and debris while allowing water to pass underneath. They are effective and simple to construct, but require a minimum constant flow, or they will fail. A typical underflow weir is shown in Figure C.8d.

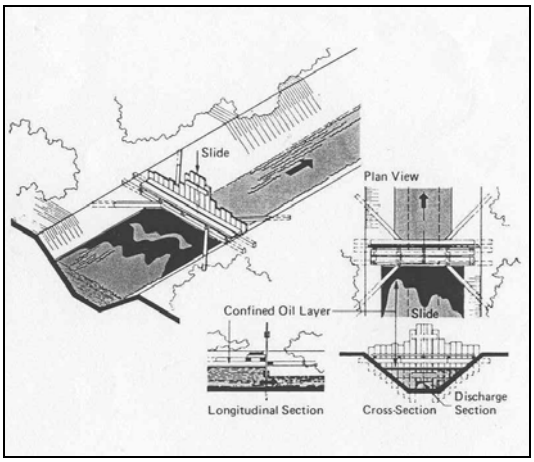


Figure C.8d Underflow Weir (Concawe 10/83)

This design has a sliding or adjustable gate that allows adjustment to the system should flow rates change. Structures of this type are used to control agricultural and/or tidal flow, and are common throughout the area of interest. These structures may be useful in spill control.

The purpose of the overflow structure can be to add a water foot to the stream, preventing sediment contamination, or to improve the recovery of oil by floating and concentrating collected material. Overflow weirs or dams impound both oil and water, and will be overtopped as the fluid level rises above the height of the structure. Diversion booms may be added upstream of the weir to divert oil to a collection point for recovery, as shown in Figure C.8e.

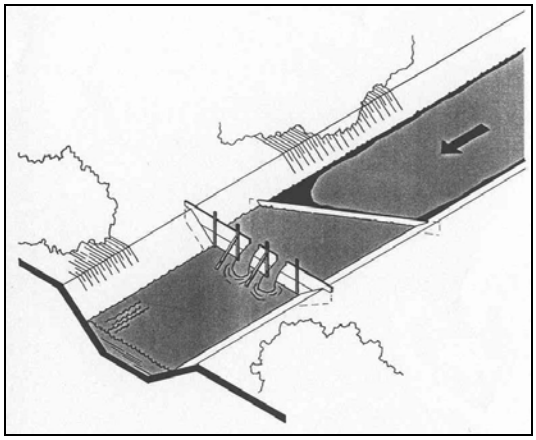


Figure C.8e. Overflow Weir (Concawe 10/83)

For oil spill recovery, overflow weirs must be installed and operated with upstream collection devices. These devices may include underflow weirs or conventional booms, or underflow weirs, as shown in Figure C8f.

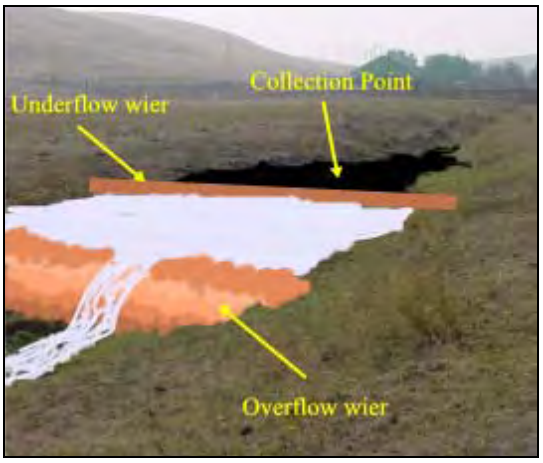


Figure C.8f Combination Underflow and Overflow Weir

Flowing water dams and weirs require constant monitoring and adjustment, with adjustment requirements proportional to changes in steam flow. If not properly maintained, all types are subject to failure and oil loss. In addition, accumulated oil must be removed routinely as it is collected.

Demobilization:

All structures should be removed at the completion of the response, and all contaminated materials properly handled and disposed of. All excavations should be returned to original contour. Care should be exercised to minimize generation of turbidity. Bypass channels or coffer dams may be necessary should turbidity or secondary oil release become problems during demob.

Variations:

The area of interest contains many existing siltation and drainage control structures that can be used directly

or with minor modification for spill control. Figure C.8g shows a typical underflow dam that can be used for spill control by blocking the underflow pipes for no-flow conditions or by adding an upstream weir or boom for periods when the dam is full.

Figure C.8g Existing Control Structure.

C.9 Culverts, Storm Drains and Street Control

Objectives:

Boards, sandbags, inflatable plugs, or earthen materials are used to block culverts as a means of containing oil flowing into ditches, creeks, or other drainage courses that feed into culverts. Culvert blocking techniques may also be used to prevent oil from entering tidal channels that are connected to the ocean through culverts.

Limitations:

Accessibility, implementation time, storage area behind culvert, flowing water, and culvert size.

General Instructions:

Install the blocking structure on the upstream side of the culvert. Use plywood, sheet metal, sand bags or other material to block the structure. Cover with plastic sheeting as necessary to seal and cover with earth, sand bags or other materials. A typical installations is shown in Figure C.9a.

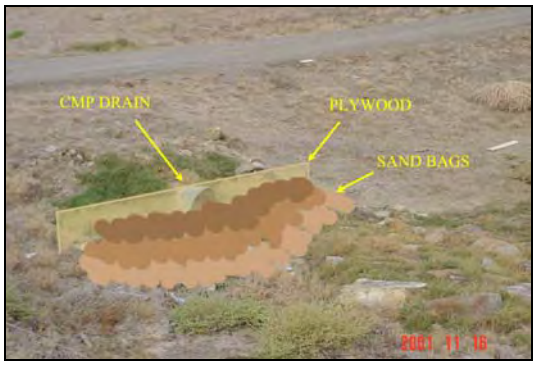


Figure C.9a Culvert Blocking

If there is little or no storage area upslope from a culvert, it may be advantageous to permit the oil to pass through the culvert and to contain the spill below the culvert outfall. In areas where a culvert outfall discharges into a borrow ditch, the borrow ditch can be dammed to form a storage area for the spilled oil. If there is no borrow ditch or similar structure draining the culvert outfall, a storage area can be created by constructing a horseshoe-shaped dam around the outfall.

Containment Sand bags, earth or other loose materials are placed to contain and/or divert oil flowing on pavement to low spots or impoundment areas, as shown in Figure C.9b.

Figure C.9b Street Impoundment

Inspect street surfaces to determine construction (most streets are designed with center crowns, causing surface flow to curbs. Occasionally, streets are designed with reverse crowns, and surface

flow is toward the center of the street. If curbs are used for one side of the containment, containment capacity will be finite. Be prepared to add additional sections of containment along adjacent sections of street, if necessary.

Storm Drain Blocking Entrance of oil into storm drain systems can create difficult cleanup problems, and, in some cases, fire and explosion hazard. Oil can be prevented from entering storm drains by placing plywood, planks or other flat materials over the opening, and placing plastic sheet and earth or sand bags on top to hold the closure in place. Typical closure methods are shown in Figure C.9c. Heavy mats have been specifically designed for this purpose, and should be used if available.

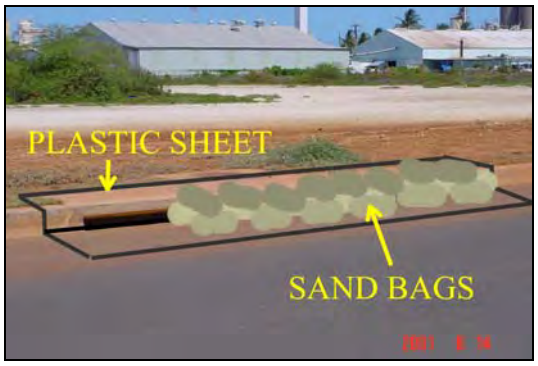


Figure C.9c Storm Drain Blocking

Water Management:: Water management will become an issue in the event of rainfall simultaneous with the spill event. In this situation, impounded water must be removed or overtopping of containment areas will occur. Water removal can be conducted with vacuum trucks, or by installing permeable filters in the containment berms or storm drain inverts.

Maintenance:

Periodically check culvert for leakage and adjust as necessary. If flowing water is present, more frequent monitoring will be required. Remove collected material periodically.

Demobilization:

Remove the block from the culvert and dispose of all contaminated materials properly. Inspect culvert for blockage and clean out as necessary.

Variations:

Water flowing into the collection point must be released. Water management can be accomplished using installations of pipes or weir structures as discussed in Section B.10.

C.10 Flood Control Canals

Objectives:

The pipeline alignment is adjacent to flood control canals in a number of locations. In addition, spills entering storm drains will generally discharge to flood control canals. Control actions will vary according to the characteristics of the canals, flow conditions and sediment / debris loadings. Measures described herein are intended to guide the development of control measures that can be safety implemented. Control measures described herein may also apply to response actions in major aquaducts.

Limitations:

1) General. All operations in flood control canals and aquaducts should be considered as a hazardous due to the potential for rapidly rising water. Wherever possible, operations should be conducted from banks or access points. During periods of high runoff, high flow velocities may preclude effective operations in many areas. Under these circumstances, examine downstream areas for control points where effective operations can be implemented. High debris loadings can be expected in all high flow cases. High debris loadings can damage or cause booms to fail, and clog recovery devices. To the degree possible, debris control measures should be installed upstream of containment, control and recovery operations.

2) Natural Channels These channels may contain extensive stands of vegetation which is either growing or has washed out of up-lying areas. While this vegetation is not of itself remarkable, it can be very dense and significantly complicate control and cleanup. To some degree, this material may act as a natural filter. In other cases, it may complicate or prevent operations altogether. Such vegetation may also support large populations of waterfowl and other birds or animals that may be of concern in the event of an oil release. Where practical, it may be beneficial to selectively clear (pre-clean) operational areas before the arrival of oil.

3) Box Culverts and Armored Channels In general, operations in these channels will be possible only during no, or low-flow conditions. During periods of high runoff, operations in these channels may be hazardous. During high runoff, shift recovery operations to channel discharge points if not operational locations can be found nearer to the source.

General Instructions:

1) As a general run, oil will tend to accumulate on the downwind side of the canals and channels, particularly

on turns. Control points should be selected at points where the oil is forced to one side of the canal, where flow velocities are low enough, and where safe access is possible.

2) Sediment Islands. Flood contol canals that have not been maintained regularly may develop sediment accumulations known as sediment islands. Where possible, use booms and berms to divert oil to one side of these islands and water to the other.

3) Water Supply Canal / Aquaduct Hard booms may be utilized to divert oil which has entered water supply canals to an accessible collection point. Booms should be deployed diagonal to the axis of the canal with the down current point of connection on the down-wind side of the canal (if practical) as shown in Figure C.10a. Deployment of multiple booms may be advisable, with sorbent booms additionally deployed to trap any sheen passing the hard boom.

Figure C.10a Booming of Water Supply Canal
(Courtesy Clean Bay Inc.)

4) Low Flow Conditions. During low flow (or no flow) control actions will generally be restricted to berming and dams. Containment locations should be located where there is vehicle access for recovery equipment. If practical, and with the approval of the ICS, vehicles and personnel may enter the canal, as long as runoff conditions are being monitored. A typical containment berm in a concrete culvet is shown in Figure C.10b.

Figure C10b Low Flow Containment Berm.

5) High Flow Conditions. Select control and recovery points at locations where flow velocities and volumes are within the operational range of the technique to be used. These sites should also be readily accessible by vehicle. Debris control measures should be deployed upstream of the control site, if practical. Depending on water depth, booms or berms should be used to divert oil flow to one side of the canal (berms may be cascading). Booms will require long heavy cables and solid anchoring points on land.

Several sets of booms or berms may be required. Sorbant boom should be installed downstream to control any minor bleed-through. Recovery can be accomplished at collection points using vacuum systems or skimmers (Skimmers with pumps at water level may be necessary for sites where vertical lifts exceed 25 – 30 feet). Access points, safety equipment and rescue capabilities must be provided if any personnel are working in canals. If flow velocities are excessive, move control sites to quieter locations downstream. Do not attempt to operate under extremely high flow conditions.

Maintenance:

All deployments should be inspected on a regular basis. Under even moderate flow conditions, booms and barriers can be damaged, and periodic repairs and re-deployments should be anticipated. Oil should be removed as soon as it accumulates. In some areas, debris may cause damage and can be expected to complicate material handling problems. Debris that accumulates on debris control barriers should be removed on a regular basis to prevent barrier failure. Rather than attempt to remove these accumulations periodically during an event, it may be more appropriate to attempt to protect ion and recover oil and oily debris after the mobile phase of the oil is past.

Demobilization:

Booms should be cleaned and repaired on-site. Berm materials should be removed and, if oiled, cleaned onsite or removed for recycling or disposal. All changes in grade should be restored to natural, or pre-spill conditions.

Variations:

Each case must be assessed on a case-by-case basis. Appropriate techniques are dependent on conditions encountered, and may differ from those described above.

APPENDIX D

CLEANUP PROCEDURES

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D.1 VACUUM RECOVERY

Use:

This section covers use of vacuum trucks, air conveyor systems, and portable vacuum equipment. These devices may be utilized directly or in combination with a variety of skimmers and slimming heads (intake nozzles). Vacuum equipment is generally readily available, and has application to recovery of oil floating on water, oil on smooth and irregular land surfaces, and may have application in the recovery of heavy oil submerged at relatively shallow depths.

Limitations:

Access to spill site to recovery site and heavy debris accumulations limit system performance. Vacuum systems will collect significant amounts of water that will require handling and treatment. In addition, vacuum equipment is limited to lifts of less than approximately 30 feet. Vacuum equipment may not be explosion-proof. Extreme caution should be exercised when recovering fresh volatile materials, or in cases where explosive atmosphere may be present (storm drains).

General Instructions:

<u>On-Water Recovery</u>

Recovery of oil on water requires that the vacuum equipment be positioned close to the oil accumulation, either at accessible point along the shoreline, or on barges or vessels. Position vacuum truck adjacent to area of heaviest oil concentration such as behind booms, berms, trenches, sumps, etc. Place the suction hose nozzle in the oil and maneuver manually at the surface until recovery becomes inefficient (too much water collected).

A small special purpose vacuum unit is shown in Figure D.1a. This unit may be used in shallower water or along shorelines. Equipped with a manifold and multiple recovery hoses, this unit is commonly used to recover oil along shorelines.

Figure D.1ba Special Purpose Vacuum Recovery System

Placing the vacuum hose directly into the pooled oil, this method will typically recover a large percentage of water unless the oil is very thick. Recovery of water should be minimized, as it utilized storage capacity. In addition, recovered oily water will typically require treatment. The efficiency of oil recovery can be improved by attaching a skimming head or nozzle to the vacuum hose. Some examples of skimmer heads are shown in Figure D.1c.

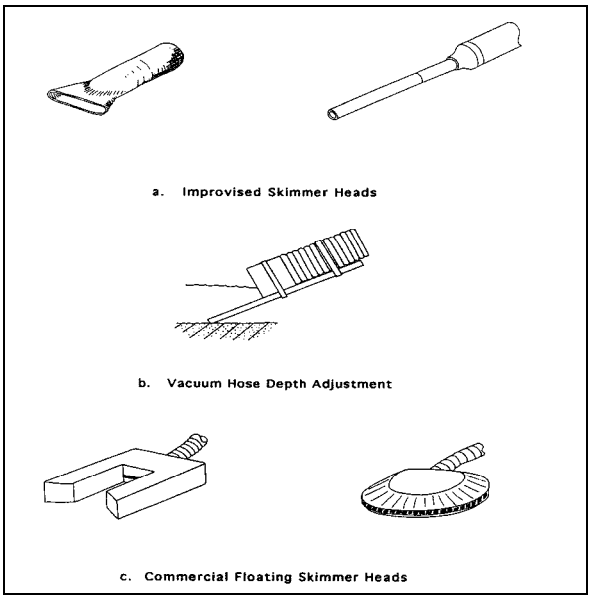

Figure D.1c Vacuum Nozzle Configurations (Typical)

These include a length of pipe that has been flattened to increase its water interface length. As with the plain hose, a wood block can be used to maintain proper depth and minimize operator fatigue. This figure also shows a bell reducer used to attach a narrow pipe, or stinger. Stingers have special application in the recovery of oil in rocks and cracks. Several common commercial floating skimmers that can be attached to the vacuum hose. These skimmers are small enough to be maneuvered by on or two workers.

Floating debris is usually present and, while the vacuum systems can usually accommodate some debris, skimmer and nozzle clogging problems are common, particularly with small diameter units, such as stingers. Screens may be fitted over the skimmer head to exclude debris. In all cases, a full time operator is needed to maintain proper positioning and operation.

In Figure D.1d debris has been contained away from the recovery area, and a vacuum is being used to recover oil.

Figure D.1d Debris Management / Vacuum Recovery
(Courtesy Clean Bay Inc)

Land Surfaces Vacuum systems also have application for the recovery of oil on land. In Figure D.1e, a vacuum truck is used to recover oil impounded at a road culvert.

Figure D1e Vacuum Recovery of Oil Impounded at Culvert

Smaller vacuum units are also available. A typical small vacuum system is shown operating on a shoreline in Figure D.1f.

Figure D.1f Portable Vacuum Recovery System (Vikoma).

Commercial vacuum-operated street cleaning equipment may also have application for recovery of surface oil on flat surfaces such as sandy beaches and pavement.

Large quantities of water are usually generated with vacuum collection devices. In most cases, oil placed in vacuum truck or other tanks will gravity separate, and underlying water can be decanted, allowing the oil to be concentrated, and separated, thereby reducing volumes of fluids requiring treatment

Logistics The primary logistical requirements for vacuum truck usage are summarized in Table D.1a.

	Terrestrial/Shoreline	Surface Water
Equipment • Vacuum truck w/3" suction hose	Typical suction rate for pooled oil, 100 gpm (75% oil); fill time for 110 bbl truck, ¾ hour	Typical suction rate for oil on water, 50 gpm (5% oil), fill time for 110 bbl truck, 1½ hour.
Number of vacuum trucks required	Dependent on quantity and distribution of oil	Dependent on quantity and distribution of oil and oil to water ratio
Personnel One person per suction hose and one to two persons for manual skimming and concentrating of oil, and one supervisor.		
Support • Vacuum truck, 6 to 140 bbl (typical) 6" suction hose, 700 to 800 - 900 gpm max* 4" suction hose, 500 - 600 gpm max.* 3" suction hose, 300 - 400 gpm max.* • Devices for concentrating oil on water • Booms, skimming boards, low pressure water hoses • Lights for night operation		
Access Requirements Heavy equipment, barge, or landing craft		

* Intake completely submerged, drawing water with little or no suction lift.

Table D.1a Logistical Requirements for Use of Vacuum Truck(s)

D.2 SKIMMING OPERATIONS

Use:

A variety of skimming devices are available for recovery contained or uncontained spills of various sizes. The skimming devices generally rely on oil buoyancy, adhesion to surfaces or viscous properties. Most require oil to be floating on water, but some can operate with minimal or no water. Stationary, self-propelled or towed skimmers are available in various sizes to suit most applications.

Limitations:

Most skimmers require that the oil be pumpable. With a few exceptions, effectiveness is diminished with high viscosity or solidified oils. Skimmer effectiveness is also limited by adverse environmental conditions (e.g., excessive wave height, strong currents, winds). Skimmers that rely on adhesion of oil to a disk, belt or sorbent mop cannot be used simultaneously with most chemical treating agents. Skimming of gasoline is not normally recommended for safety reasons and the high volatility of the material.

An additional major limitation in the use of skimmers lies in the capacity to store the large quantities of fluids that they are capable of recovering. Regardless of its effectiveness or efficiency, a skimmer can only be operated as long as storage is available for the recovered oil / water.

General Instructions:

Oil Pretreatment Heavy debris loading may occur as a result of natural processes and can significantly interfere with free oil
recovery.

Nets or fencing may be installed upstream of the recovery containment to exclude floating debris.

Skimmer Selection A wide variety of skimming devices are available for general use. However, for maximum performance (or any performance at all) the equipment must be matched to the oil type, oil condition (state of weathering), and environmental conditions. Skimmers which work on fresh oil may not operate effectively on weathered oil, so constant monitoring and assessment of performance is required. The following discussion focuses on equipment suitable for distillate fuels and temperate operating environment, and is not intended to be an exhaustive description of the diversity of skimmers manufactured:

Available in a variety of sizes, skimming devices can be either stationary (they don't move, and the oil brought to them) or advancing (they are self-powered and can move to the oil). Stationary skimmers include small portable units, while advancing skimmers are generally large and designed for openwater applications. Small portable stationary skimmers are most applicable to Wickland needs.

• Weir or disk -type skimmers are commonly available and effective on lighter oils, including jet fuel. Their performance is limited with higher

viscosity or weathered oil, very shallow water (the units must float freely to operate properly) and conditions with high debris loadings. Typical of the portable skimmers is the Douglas SkimPac (Figure D.2b). As with most weir skimmers, these units are connected to a pump or vacuum system and holding tank.

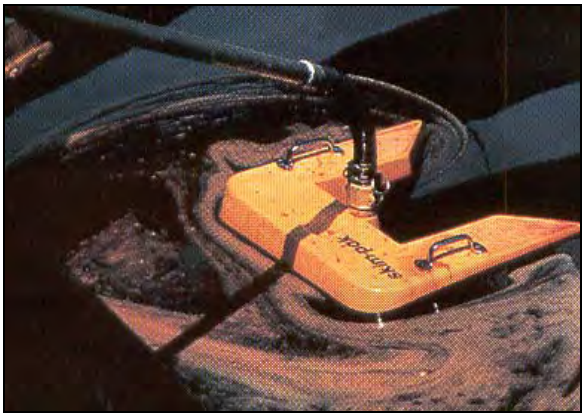

Figure D.2b Weir Skimmer (SkimPac)

Skimmers should generally be deployed with deflection and concentrating booms to increase the thickness and amount of oil presented to the skimmer. Use of booms to concentrate and direct oil to a skimmer is shown in Figure D.2e.

Figure D.2e Use of Booms with skimmer.

Skimmer Operation Guidelines

Shallow Water / Land Recovery Most portable skimmers can be used for oil recovery in shallow restricted areas if the oil: water mixture is deep enough to permit proper operation of the device. Portable skimmers should be positioned at accessible oil concentrations behind booms, berms, trenches or anywhere that oil accumulates or can be accumulated. In some cases it may be necessary to excavate a shallow hole to allow the device to deploy properly. In most cases, it will be necessary to continually adjust and reposition the skimmer to keep it in the area of thickest oil accumulation. Recovered oil may be pumped directly to a tank, drum, or tank truck, or temporarily held in a shallow lined pit.

In most cases, oil can be directed to the skimmer or concentrated using water or air jets, or by using a boom to drag the oil to the device.

Pumps

Pumps may be needed to operate many skimming systems and transfer recovered oil and oil/water mixtures from recovery equipment to trucks or interim storage. Pumps may also be used for direct recovery of oil in cases where sufficient amounts of oil are present.

A variety of pumps are available. Those most commonly applied to oil spill response include centrifugal, diaphragm, and screw-auger or progressive cavity pumps. Fluid lifts are generally limited to less than 30 feet.

Centrifugal pumps use a high-speed impellor and are commonly gasoline

powered. They have particular application for driving water spray, flood/flush systems, and herding. They tend to be sensitive to debris fouling and viscous oil, and all will tend to cause emulsification. "Trash" pumps have a higher tolerance to debris. A typical free oil recovery operation using "trash" pumps is shown in Figure D.2m.

Figure D.2m Oil Recovery Operation Using Centrifugal pumps.

Double diaphragm (DD) pumps are commonly used to drive portable skimmers (DD pumps will generate a pulsing effect that interferes with the operation of some skimmers). DD pumps are generally pneumatically powered and will require a source of compressed air.

Auger and progressive cavity pumps are effective with viscous oils and can tolerate moderate debris loadings. They can be used for most skimmer and transfer operations.

Air conveyors use a relatively small amount of vacuum to generate a high velocity stream of air that entrains and moves oil, water, and debris. They have large intakes and can accommodate most debris and can even recover sorbets. They are capable of lifting oil over 30 feet and can recover oil and water and decant simultaneously.

Temporary Onsite Storage

Recovery operations can be conducted as long as there is a place to store recovered oil and water. A variety of portable tanks are available for temporary storage. These tanks include industrial Baker or Frac tanks and portable tanks such as the portable tank shown in Figure D.2n and the larger Fast Tanks shown in FigureD2o.

Figure C.2n Portable Tank at Decon Station

Figure C.2o Portable Storage Tanks

Also available are portable storage bladders which can be towed behind boats for water applications or mounted on flatbed trucks for land application. The condition of the oil should be considered prior to putting any oil into closed storage containers, as some oils may be difficult to remove.

Logistics:

The logistical requirements are directly related to the extent and thickness of the slick. The amount of oil a skimmer encounters is the primary factor determining the recovery rate, not the skimmer's rated capacity.

Typical logistics requirements for portable skimmers are summarized in Table D.2a.

Logistics	Typical Recovery Rate for Thick Oil Layer (2 mm)	Typical Recovery rate for Thin Oil Layer (0.1 mm)
Equipment		
• High capacity trash pump w/3-inch suction hose	75 gpm (50% oil)	50 gpm (5% oil)
• Portable weir skimmer	5 – 10 gpm (75% oil)	1 – 5 gpm (10% oil)
• Portable disc skimmer	5 – 10 gpm (90% oil)	1 + gpm (90% oil)
• Rope skimmer	3 – 10 gpm (85% oil)	1 + gpm (50 + % oil)
• Number of pumps or skimmers	Dependent upon quantity of oil and encounter rate	
Personnel		
1 person per pump suction hose, 1 to 2 persons for skimming and concentrating oil, and 1 supervisor		
Support	Range of Capacities	
• Vacuum truck	6 to 140 barrels	
• Tank truck	20 to 160 barrels	
• 3-inch suction hose	300 to 400 gpm, max	
• Pillow tanks	2 to 2,500 barrels	

Table D.2a Logistical Requirements for Portable Pumps and Skimmers

D.3 SORBENT RECOVERY

Use:

Sorbents are used to recover small quantities of oil from terrestrial or aquatic areas, especially films or sheens remaining after skimming or pumping operations have been completed. Sorbents also have application during cleanup operations in association with other cleanup activities.

Limitations:

Sorbents are generally most effective with lower viscosity fluids and lose effectiveness with solidified or highly weathered oil. Massive quantities of sorbent are required for large oil spills, and disposal costs can be high. Not all sorbent applied can be recovered. Some sorbents are not biodegradable and may present wildlife hazards. Sorbents loose their ability to collect oil in the presence of surfactants (Herders, dispersants, detergents, and perhaps other materials).

General Instructions:

A sorbent is any material which absorbs oil or to which oil adheres (adsorbs). 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

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 - montmorillonite, kaolin, fuller's earth, diatomaceous earth, etc.; vermiculite and the other micas; many forms of silicates; perlite; and pumice. Straw bales are available locally and have multiple applications in the control of land spills.

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, and 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, polyethylenes, styrenes, resins, polymers, and co-polymers. Most commercial sorbents fall into this category.

Sorbents are available in a variety of shapes and sizes, each intended for specific applications. The proper use of sorbents is an integral part of the overall containment and recovery plan. Sorbents may be used whenever mechanical skimming/suction devices cannot be used or are unavailable. Sorbents are also used frequently in

conjunction with mechanical equipment, and have a variety of additional applications, such as protection of work areas.

Sorbents should not be used on water unless there is a definite way to recover them. Some sorbent material can be reused after squeezing the collected oil out into a container; however, this is not normally done in practice. Sorbents can also be used to prevent oiling of facilities (walkways, work areas, etc.) on which oil spill cleanup equipment and/or personnel are mobilized during the cleanup operations.

Configurations Sorbent materials are presently available into distinct forms including snare, squares and strips, rolls, booms, mats, pillows and loose material

A discussion of the use and limitations of each sorbent form follows:

- Snare Snares consist of strips of sorbent attached in a pom-pom configuration. Snare is surface conforming and particularly useful in recovery of viscous oil and not of general application to jet fuel recovery.

- 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. A typical recovery operation using pads is shown in Figure D.3b.

Figure D.3b Sorbent Recovery (Pads)

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 oiled area to minimize the dripping of oil onto clean surfaces. A 55-gallon drum, plastic bags or other suitable container must be readily available to receive the used pads.

Pads are also available in a sweep configuration, or sweeps can be manufactured by attaching pads to a length of rope

at 12 to 18 inch intervals (installation of a brass grommet at the corner of each pad is recommended). Pad sweeps are useful for final area polishing.

- Rolls Rolls of sorbent materials can be used in the same manner as squares and strips and are usually made of similar materials. They are generally easier to use than squares or strips since they can be used in either short or long lengths. Like squares and strips, their absorption is limited unless they are continually turned or removed. Disposal of used 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 oiling. Areas onto which oil or oil-covered debris are to be placed should be covered with rolls of sorbent material.. The sorbent may be taped to hard surfaces to prevent its moving about. They can also be used as a protective barrier to keep oil from clean areas.

- Sorbent Pillows Sorbent pillows are generally open-mesh bags or sorbent material that can be easily placed on small 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 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 sorbing oil than does the cylindrical sorbent boom.

- Loose Materials Loose-type sorbent materials must be used with caution as they may be difficult to control and recover. They can, however, play an important role in wetland and land spill control and recovery.

  In general, application of loose material on water is not recommended. Exceptions include situations where the material can be concentrated and recovered. Loose sorbents may also have application in the immobilization and/or removal of oil from wetlands. An example of immobilization of oil in a wetland hardpan is shown in Figure D.3c. In this case, a biodegradable sorbent has been applied to reduce potential impacts associated with any material not recovered.

Figure D.3c Loose Sorbent Application

For general application in a wetland, sorbent is allowed to float into the wetland and contact oil, and is then recovered by water flushing and use of nets). A typical control and containment and recovery is depicted in Figure D.3d.

Figure D.3d Application and Recovery of Loose Sorbent

Application of loose sorbent is, however, and important tool for the recovery of oil from land surfaces (including streets). In - these cases, the sorbent may be worked into the surface with brooms and recovered by sweeping or with shovels. Soil has sorbent qualities, and can be utilized in absence of other materials. Soil should not be used in proximity to water, however, as it may cause sinking.

Application Techniques Place sorbents directly on the oil and turn continually until completely oiled. Put oiled sorbents in plastic bags or leak proof containers and replace with clean ones. Inert substrates can be wiped clean with sorbent pads or sheets. Sorbent sweeps or booms may be pulled between two boats across aquatic areas or anchored across slow moving streams to recover sheens.

Logistics:

The logistical requirements are heavily dependent on the type and degree of oiling and therefore cannot be accurately quantified prior to a spill. However, large quantities of sorbents may be required, and provisions for their handling and storage included in the development of the Incident Response Plan. Some of the basic equipment and materials required for sorbent recovery are pitchforks, rakes, shovels, boats (if needed), and plastic bags, drums, debris boxes, or other leak proof containers.

D.4 MECHANICAL RECOVERY

Use:

Earthmoving and Construction techniques have been utilized for the recovery of surficial oil on land and shorelines. In many cases their application is more cost effective and less environmentally damaging than use of other techniques, including manual recovery. In addition, equipment is available commercially for removal of rocks and debris (including tar balls) from beaches and other sedimentary environments.

Limitations:

Mechanical recovery can result in physical damage to the environment, accelerate natural erosion in many areas, and can result in the removal of excessive amounts of clean materials. Operation of heavy equipment for spill cleanup can involve activities in dangerous locations such as coastal shorelines, streambeds and high slope areas.

General Instructions:

<u>Earthmoving Equipment</u> General operating instructions and recommended use for each type of equipment are discussed below. Equipment may be used individually or in combination.

- <u>Motor Grader / Elevating Scraper</u> Used on sand and gravel shorelines, streambeds or an unconsolidated soil where trafficability permits and where oil penetration does not exceed several inches. Motorized graders are used to cut and remove the oiled surface layer, side-casting it into windrows which can be picked up by motorized elevating scrapers and hauled to a stockpile / loading location or to a disposal site. Motor grader blades should be set to an angle of 140 degrees from the direction of travel and the cut depth to the depth of oil penetration. Excessive cutting depth will generate large amounts of clean material which will be mixed with oily material and require disposal. Windrows should be cast parallel to the shoreline or along topographic contours. Elevating scrapers straddle the windrows with their cutting blades also set to the depth of oil penetration. Figure D.4a shows the sequence of cuts for a motor grader / elevating scraper combination.

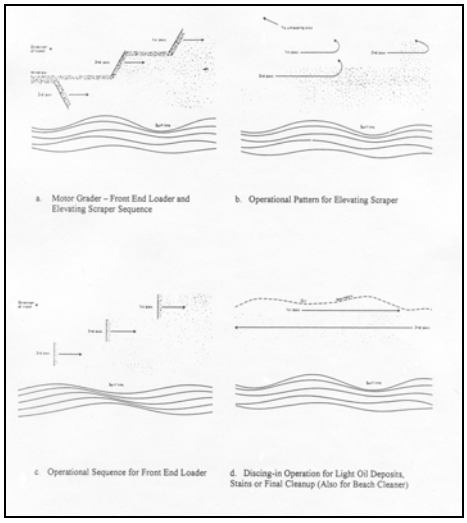

Figure D.4a Mechanized Recovery Techniques

- Motorized Elevating Scraper
  Used on sand gravel or unconsolidated soil surfaces where oil penetration exceeds several inches, or to remove tar balls, patties or oily debris. Operate the scraper parallel to the shoreline or along topographic contours. Set the cutting blade to the depth of oil penetration, or a skim cut for surficial oily debris removal.

  In Figure C.4b, a motor grader is used to form windrows of oily sand for recovery. Note that tracks have been applied to the drive wheels of the motor grader to improve its ability to traffic the sandy beach. A similar effect may be achieved through the use of flotation tires or by lowering tire pressure.

Figure D.4b Windrow Side Casting Using a Motor Grader

In Figure D.4c, a motorized elevating scraper is used to recover oily windrows.

Figure D.4c Oily Windrow Recovery With Elevating Scraper

- Motor Grader / Front End Loader
  Windrows are cast by the motor grader as previously described. Front end loaders are used in place of elevating scrapers to pickup windrowed material and transfer it to a stockpile or loading area. Use of a front-end loader will require more trips and potential for working contaminated materials deeper in to the substrate. In addition, depth of cut is harder to control, and removal of excess clean material is possible.

- Bulldozer / Front End Loader
  Typically a bulldozer will be used on coarse sediment or rough terrain where oil penetration is deep and trafficability is poor. Operate the bulldozer to push

oiled material into piles for removal by the front-end loader. The depth of cut should match the depth of oil penetration as closely as possible, although cut depth is more difficult to control l with a bulldozer. When operating in a tidal environment or a where water level may rise, cleaning should be conducted from the lower areas to the higher areas, with material pushed to above the expected high water line.

- Backhoe Used to remove oiled sediments from steep banks where other types of equipment may not be able to operate safely. Position the backhoe at the top of the bank with the boom fully extended. Maneuver the bucket from the downhill edge of the area to be removed, and work upward. Excavated materials can be temporarily stockpiled on site, or placed directly into dump trucks.

- Front End Loaders Used primarily to load stockpiled or windrowed material. May also be used to pick up debris or clean areas with patchy oiling or poor trafficability. Front-end loaders are wither rubber tired or tracked and can be fitted with buckets for various uses, with capacities ranging from 3/4 to 10 cubic yards. Rubber tired loaders with 4 in 1 buckets are preferred for general use. Buckets should only be filled to 2/3 capacity to prevent spillage during transport and loading.

- Haul Trucks Saturated materials should be drained prior to loading. If necessary, leachate can be collected and treated. All trucks should be lined with plastic sheets prior to loading, to prevent leakage of any remaining free oil and oily water. New liner material should be used for each load. Tarpaulins should be used to cover all loads. Depending on the degree of contamination, it may be necessary to clean truck wheels and undercarriages prior to their leaving the loading areas. Each truck should be inspected and logged for load size and condition, and tared (weighed empty), so an accurate record of material removed can be made.

  The number of trucks required will depend on truck size, disposal facility location and cycle time, and the size of the recovery operation. The most generally applicable size trucks are 10 wheel single bed dumps or truck - trailer combinations. Ten wheel dumps typically have a capacity of approximately 8 cubic yards.

Loading Ramps Loading ramps expedite the loading and off-loading of recovery and transportation equipment such as elevating scrapers and dump trucks. Ramps can be constructed at the time of the incident from available materials. A typical ramp design could consist of two cribs of railroad ties placed on either side of a pit sized to accommodate either a frame conveyor (for loading trucks) or the trucks themselves. The cribs are backfilled with earth, and approach ramps

constructed on either side. Railroad ties are placed along the top of the cribs and fastened with timber spikes. Railroad rails are then used to bridge the gap between the cribs and welded to bearing plates bolted to each crib. The center of the bridge is left open to allow bottom-dumped material to fall into the underlying conveyor hopper or truck.

Temporary On-site Storage

Significant amounts of oil and oily material may be generated during a spill response. To maximize the efficiency of the recovery operation, it may be desirable to temporarily stockpile recovered material near the cleanup location or at some intermediate location. Oil in recovered material may be mobilized by rainfall or sunshine. Particular care must be exercised in the handling of all material to prevent contamination of additional areas. Areas where recovered materials are temporarily stored should be prepared. Temporary storage sites can be prepared using earth berms and plastic liners to control runoff. A typical temporary storage site is shown in Figure D.4h. If necessary, the plastic liner can be covered with a soil layer to protect it from damage.

Figure D.4h Lined Temporary Storage Site

Logistics:

Logistical requirements depend on the size of the spill, recovery and loading capacity of the equipment and the haul distances and cycle times involved. Typical logistics requirements for mechanical cleanup techniques are summarized in Table D.4a.

Item	Haul Distance	Haul Distance	Combined Cleaning Rate (hr/hectare)
Equipment	150m (500 ft)	600m (2000 ft)	
• Motor grader	1	1	
• Elevating scraper (20yd)	2	4	3-3 ½
• Front-end loader (tired)	2	4	8 – 8.5
• Front-end loader (tracked)	2	6	11 – 11.5
	12 ft bucket	16 ft bucket	
• Backhoe	4	3	16 – 17
Personnel	1 equipment operator for each machine, 1 supervisor, maintenance/fueling crew.		
Fuel Requirements (gal/hr)			
• Motor grader	3 - 8		
• Elevating scraper	9 - 15		
• Front-end loader	5 - 5.5		
• Backhoe	6 - 7		
• Dump truck	6 - 12		

Table D.4a Logistics Requirements, Mechanized Recovery

D.5 MANUAL RECOVERY

Use:

To recover oil using manual methods such as scraping, shoveling, raking, and wiping, in areas inaccessible to cleanup equipment, with sporadic oiling, or as the final stage of a cleanup operation.

Limitations:

Environmental sensitivity of area to intense human activity, cost-effectiveness, and recovery efficiency.

General Instructions :

Manual labor is usually applied in the cleanup of shorelines and inland areas, for a variety of reasons, including lack of an alternative cleanup approach couple with the need to show some level of response. Typically such responses are not particularly efficient and in some cases, they may actually create more damage that no action. However, manual recovery operations may be the only viable method for cleanup in difficult and inaccessible areas or under special circumstances.

Remove small pools of oil with buckets and sorbents, and surface deposits of oiled debris and vegetation with shovels, rakes, or pitchforks. Oil layers on rocky outcrops or cliffs, boulders, manmade structures, etc., are removed by scraping or wiping with sand (must be recovered and disposed of) or sorbents. Small quantities of oil or oily debris can be placed in plastic bags and removed for disposal. Larger quantities can be placed in barrels or debris boxes for disposal, or lined pits for temporary storage. On beaches or rivers all material must be stored above the high-water line. Oil and oiled materials should be removed manually or by truck, helicopter, boat, or barge to a prepared interim storage site as soon as possible.

Workers will require considerable supervision. Organize teams of 10 to 20 workers, each with a lead cleanup supervisor. A typical manual shoreline operation is shown in Figure D.5a.

Figure D.5a Manual Cleanup Operation

Manual cleanup may also have application in mangroves and other wetlands where mechanized operations are impossible but removal of bulk contamination is nonetheless necessary

Logistics:

The primary logistical requirements for manually cleaning a shoreline will vary with the degree of oiling. Table D.5a gives the primary logistical requirements

for both light and heavy oiling of a 1 mile by 50-foot area.

	Light or Sporadic Oiling	Heavy Oiling
Equipment		
• Debris box	2	3 - 4
• Helicopter (if used)	1	1 – 2
• Boat or Barge (if used)	1	2 - 3
• Truck (if used)	1	2 - 3
Personnel		
• Workers	10 - 20	50 - 100
• Supervisors	1 – 2	5 - 10
Access Requirements		
Foot, light vehicle, shallow draft craft, or helicopter		
Estimates based on 1 mile by 50 feet area		

Table D.5a Logistical Requirements, Manual Recovery

D.6 FLOODING / FLUSHING

Use:

To remove oil from manmade structures, rocky, boulder, cobble, or sandy shorelines, or any substrate with relatively few or no living organisms, by flooding or flushing with low-pressure cold, warm or hot water streams. Prior to the use of warm or hot water, qualified personnel should inspect oiled surfaces for biological activity. The use of warm or hot water may kill and/or remove attached plant and animal life.

Limitations:

Accessibility and substrate erosion potential. In addition, incorrect application of the technique may force oil deeper into the substrate. Oil removed by these techniques may be subject to additional movement and must be contained and recovered.

General Instructions:

Flooding The flooding procedure is intended to add sufficient water to the substrate to float the oil vertically out of the sediment and then down gradient to a recovery point. It requires large volumes of water applied at low pressure, and is difficult to conduct in highly permeable soils.

Flooding is conducted by introducing large volumes of ambient temperature water through a perforated hose or pipe just above the zone to be treated (water is not applied directly on the oil). The flooding water is allowed to flow to the surface carrying loose oil with it. As each area is flushed, the water application zone is moved down gradient, working down to the lowest point. In tidal areas it should be timed so that the lowest point is reached at low tide. Oil removed by the water flood can be recovered by using berms or trenches to channel the oil to a sump or other collection point for recovery. For aquatic areas, the oil may be allowed to run back into the water where containment booms have been positioned. Pumps, vacuum trucks, skimmers, and/or sorbents are used to recover oil from the containment or collection points. Place plastic sheets over adjacent surfaces to prevent re-oiling and direct oil and water to the desired area. For large areas a series of berms or ditches is used to channel the oily runoff to recovery areas. A wetland flooding operation is shown in Figure D.6a

Figure D.6a Wetland Flooding Operation

Flushing Flushing is most applicable to soils having low permeability and low oil penetration. In flushing, water is applied directly to the oiled sediment through fire hoses, starting at the upper portion of the oiled zone and working down gradient. Water is applied at ambient temperatures through a single or multiple (manifolded) hoses at a low angle to the surface. Application of the water at a high angle will tend to force the oil downward and may cause unnecessary soil erosion. The water flow loosens the oil and tends to move it down gradient. Flushing should not be continued if it merely drives the oil deeper into the substrate. The general flushing pattern is shown in Figure D.6b.

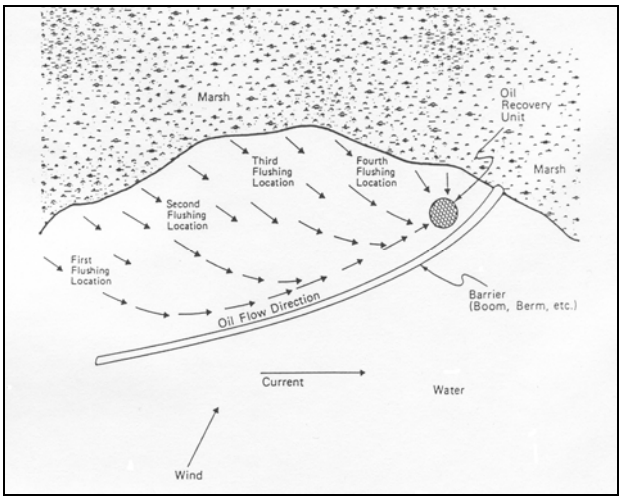

Figure D.6b Generalized Wetland Flushing Pattern.

Flushing may be conducted using portable pumps from the shoreline or from small boats as shown in Figure D.6c

Figure D.6c Wetland Flushing / Herding

Care must be exercised to minimize emulsification of the oil by excessive mixing, erosion of soils, and physical damage to vegetation. If operator enthusiasm is resulting in unnecessary damage, it may be necessary to permanently fix flushing nozzles to the bow of the spray boats.

Combined Flooding / Flushing In cases where flushing may be driving the loosen oil into the sediments, a flooding component may be added to create an upward and down gradient flow regime. This is accomplished by conducting both procedures simultaneously. A flushing component may also be added to the flooding procedure to facilitate the movement of oil to the collection point once flooding has loosened it.

Logistics:

The primary logistical requirements for using hydroblasting or low-pressure flushing to clean a 1-mile by 50 foot lightly oiled area are approximated in Table D.6a. Steam units should be capable of salt-water operation.

	Type	Number Required
Equipment		
• Flushing unit (pump, hoses and optional boat)	10 - 20 psi pressure @ 50 - 100 gpm	3 - 5
• Vacuum truck or • Tank truck	110 barrel + capacity 125 barrel + capacity	1 - 2 1 - 2
or • Containment and skimming capability or • Sorbent recovery capability	 As required As required	
Personnel		
• Flushing - from land	1 operator per unit, 1 maintenance/refueling person per group, 1 supervisor per group	
• Flushing - from boats	2 operators per unit, 1 maintenance/refueling boat per group, 1 supervisor per group	
• Recovery	As required	
Access Requirements		
Road access, barge or landing craft required for vehicles, shallow draft boats for manual efforts.		

Table D.6a Logistical Requirements for Flushing Wetlands

D.7 VEGETATION REMOVAL

Use:

In situations where heavy oiling of vegetation presents unacceptable environmental risk, removal of vegetation by be necessary. A variety of procedures and equipment are available for vegetation removal on land and along shorelines.

Limitations:

In some cases, oiled vegetation may present an environmental hazard to birds and other animal populations. It may also trap and release oil over time, also creating an environmental threat. If the oiling is very heavy, and/or completely covers the vegetation, plant mortality may occur. In these situations, removal of the oiled vegetation may be warranted. In most cases of crude oil contamination, weathering rapidly renders the oil inert, and more damage is created by conducting cutting operations than by allowing the oil to degrade naturally. The potential for causing ling term damage through physical contact and mixing of oil into sediments exists. Vegetation cutting also presents moderate risks to operators.

General Directions:

Emergent Vegetation Emergent vegetation refers to the visible portion of wetland vegetation. Emergency reed-like vegetation may be removed using laborers equipped with gasoline powered weed eaters (string trimmers preferred for safety reasons) of with sickles or similar manual cutters. Hand saws, chain saws or heavy equipment may be required for larger woody vegetation.

Vegetation, which may be encountered in streambeds, is typified in Figure D.7a.

Figure D.7a Heavy Streambed Vegetation

Vegetation of this density may act as a filter and localize contamination being transported by the stream. It may also significantly complicate access and cleanup operations. If time permits, it may be advisable to remove dense vegetation at intended control and recovery locations.

Cutting teams will need supporting collection (raking and bagging crews to collect the recovered material. To minimize damage to root and rhizome masses, foot traffic on the wetland surface must be held to a minimum. A typical two person cutting team is shown in Figure D.7b.

Figure D.7b Two Person Cutting and Raking Team

Submergent Vegetation Oiling of submergent vegetation can occur when water levels rise, or in the event sinkers are involved. In these cases, aquatic weed cutters are available. These floating devices can accomplish cutting without operations on the wetland surface. They are available in a variety of sizes ranging from two man units to large vessels with conveyor systems, design for lake and waterway maintenance. All cutting operations should be designed in consideration of wind and current direction. Operations should be planned to prevent recontamination of cleaned areas.

Land Vegetation A variety of garden and agricultural cutting equipment are available, ranging from gasoline-powered weed cutters to self-propelled weed shears. Selection of specific equipment should be based on characteristics of the vegetation and areas to be treated and equipment availability. All cut vegetation should be progressively collected and stockpiled to control oil leaching. Cutting equipment can present worker hazard and should be used with caution.

Logistics:

Logistical requirements for typical wetland cutting operations are summarized in Table D.7a.

Equipment	Number per Crew
Cutting Tools	
• Scyles	3 - 4
• Weed Cutters	3 – 4
• Chain Saws	1
• Shears	2 – 3
Collecting Tools	
• Rakes	4 – 6
• Pitch Forks	4 – 6
Plastic Bags	75 - 100
Plastic Sheeting	1 - 3 rolls
Personnel	
5 crews, 10 workers each	Variable, est. each crew can cut 65 m2/hr
1 Foreman per Crew	
Access Requirements	
Foot, vehicle, shallow craft, helicopter	

TableD.7a Logistical Requirements for Wetland Cutting

Variations:

A wide variety of hand and mechanized equipment capable of cutting vegetation in wetlands and on land are available. Equipment selection should be based on effectiveness in cutting of the contaminated vegetation, and operator safety.

D.8 AIR / WATER JET HERDING

Use:

Both air and water jets have been utilized successfully to move oil on water, either away from sensitive features, or out of contaminated shorelines and wetlands. Air jets can be generated using gasoline powered backpack leaf blowers. Water jets can be applied from shore or from shallow draft boats, and typically utilize commonly available 1 1/2 inch gasoline-powered trash pumps.

Limitations:

Applications of both air and water jets must be applied in the direction of prevailing winds and currents, and are generally of limited application in variable current or tidal situations. Removal of oil from previously oiled areas will not be complete. In most cases, residual oil will adhere to surfaces and be trapped in pockets or under rocks. Use of excessive water pressure or misdirection of water jets can result in undesirable sediment erosion of entrainment of oil in the water column.

General Instructions:

Air Jets have a limited radius of influence and are primarily used to move oil out of already exposed areas. Backpack leaf blowers are most commonly employed for this purpose, and must be operated with the prevailing movement of the floating material (i.e. Apply the air jet in the vicinity of the oil: shore interface, working from the shoreline outward, and from upstream to downstream.

Water Jets Water jets have been applied successfully to control oil movement using a variety of configurations including hand-held fire nozzles, fire monitors, fire nozzles fixed to small boats, spray bars attached to small boats, and irrigation pipe placed along shorelines.

A “fixed jon-boat” configuration is recommended for stream and lake applications, particularly those involving emergent vegetation of brush. In this installation, a 1 1/2 inch gasoline powered trash pump is placed in the bow of a shallow-draft aluminum boat (jon boat typical). The intake hose is fixed to the side of the boat, and a fire nozzle attached to the discharge hoes. The nozzle is fixed in position pointing forward and impacting the water at a shallow angle about to feet ahead of the boat. The nozzle is aimed by moving the boat. The boat the then maneuvered (either using an outboard motor or guiding the boat from in the water), working from up wind/current downward.

A modification of this application uses the jon boat as a mobile platform for the pump, but uses a fire hose operated manually from the shoreline to flush oil from the backshore into the water and then in the down current direction.

A typical applications of water jets to herd oil to a recovery device are shown in Figure D. 8a and D. 8b.

Figure D.8a Water Jet Herding

Figure 8.DB Water Jet Herding
(Courtesy Clean Bay Inc.)

Maintenance Portable pumps require minimal maintenance, but must be refueled every several hours. This activity involves working in a high noise and vibration environment, and operators should be rotated frequently.

Demobilization To the degree practical, the spray boats should be operated from clean water. Decontamination may be required prior to refueling, crew changes, etc. If the boat is operated in the oil.

Logistics:

Air Jets Backpack leaf blowers can be used to herd floating oil. Blower teams should be operated in pairs, with additional 2 person support crews (gasoline supply, etc) for every 5 teams.

Water Jets Water jets may be operated from fixed locations at critical points, or from small boats. For land applications, a hose operator and two pump operators will be required for each team. Pump operators will maintain pump operation, including positioning of the intake hose, and move the pump as necessary. Boat systems (fixed nozzle, jon boat installation typical) require a pump operator and a boat operator for each team. All pumping operations will require additional personnel for fueling support.

Variations:

Individual boat systems have a finite spray sweep radius. Several spray boats can be operated in a line to increase the effective spray width.

D.9 ASSISTED NATURAL RECOVERY

Use:

Application of in-situ treatments to the oiled area as a means of stimulating or accelerating natural degradation of the oil. This can be done through soil aeration and by the addition of nutrients and / or engineered microorganisms. The technique may have application to the restoration of agricultural as well as natural lands.

Limitations:

Assisted natural recovery and bioremediation has been most successful with lighter oils. Accessibility, trafficability, depth of penetration, energy level of marine shorelines, environmental sensitivity of the area to the oil, and public or private utilization of the area can also influence the potential for successful recovery. Public opinion can influence the application of engineered bacteria.

General Instructions:

Several techniques have been developed to break up the oil layer or oiled substrate, thereby increasing the oil's surface area exposed to photochemical oxidation and microbial degradation. These techniques are primarily used on non- recreational, low-amenity areas or coastal shorelines where sediment removal will cause backshore erosion. Each is described individually below.

Push Oil Sediments Into Surf Used on light to moderately oiled beaches where sediment removal may cause erosion. At low tide operate bulldozer to push the oiled

sediments onto the lower intertidal area where the increased sediment movement breaks up the oil Sediments are returned to the beach through natural wave and tidal action.

Disc Into Substrate (tilling or aeration) Used on lightly contaminated, non-recreational sand or gravel beaches or inland substrates. Tow disking equipment by tractor or tracked loader. Conventional or chisel ploughs should be used where penetration exceeds 8 inches. Operate the tractor parallel to the surf line or perpendicular to the direction of slope for inland areas. Disking should be done periodically to aerate the sediments as much as possible.

Break Up Pavement Used on cobble, sand, or gravel beaches where thick layers of oil have formed an asphaltic pavement. Attach a ripper consisting of two or three large, curved teeth to the back of a tractor, tracked loader, or bulldozer and drag it through the pavement, breaking it up into smaller pieces. This allows natural wave action to further break up the pavement for rapid degradation.

Bioremediation Used in conjunction with disking on inland areas to

accelerate or maintain a high rate of biodegradation. After disking, fertilize the oiled soil with a standard spreader, using a nitrogen, phosphorus, and potassium (NPK) inorganic fertilizer to supplement natural nutrient supplies. A general nitrogen to oil ratio of 1:10 by weight is recommended.

This technique has also been used for wetland restoration. For wetlands, tilling of the soil is neither practical nor environmentally desirable. In this case, nutrients can be applies by air, as indicated in Figure D.9a.

FigureD.9a Aerial Fertilizer Application.

Logistics:

The equipment required depends on the technique used and the size and degree of oiling. Most of the equipment needed are standard farm items. Typical logistical requirements for Assisted Natural Recovery - type operations are summarized in Table.9a

Item	50 ft. Wide Area	150 ft. Wide Area	Cleaning Rate
Equipment			
• Tractor/Ripper	1	2	1½ hr/acre
• Track-type tractor w/8 ft wide discer	1	1	1½ hr/acre
• Track-type tractor w/12 ft wide discer	1	1	1/3 hr/acre
• Bulldozer	2	5	1 hr/acre
• Spreader	1	1	N/A
Personnel 1 operator for each piece of equipment, maintenance crew and 1 supervisor			
Support			
• Tracked-type tractor			
• Bulldozer			
Diesel Fuel Requirements			
2½ to 9 gal/hr			
4 to 14 gal/hr			

TABLE D.9a Logistical Requirements for Assisted Natural Recovery

C.10 FIELD SEPERATION OF OIL AND WATER

Use:

Many cleanup activities, particularly those involving skimming and vacuum recovery, will generate large quantities of oil, oily debris, and oily water. Field separation of oil and water phase liquids may be conducted with the approval of the Incident Command. If permitted, the following procedures can be used in the field to conduct primary separation of oil and water, reducing the volumes of waste requiring handling and treatment or disposal.

Limitations:

Field separation techniques are generally limited to gravity processes and will not achieve complete or effective separations for low gravity oils, oil dispersions or soluble oil fractions. Decanted water may contain quantities of hydrocarbons of potential concern.

General Instructions:

Regulatory approval must be obtained prior to conducting field separations of oil and water that include local discharge of decanted water.

Preliminary Debris Screening Debris screening will be conducted as part of any recovery operation to minimize equipment clogging, with screened debris requiring separate handling. Some debris will nonetheless be collected, and additional debris screening may be beneficial in fluid handling. Debris screening boxes can be fabricated from expanded metal and used to filter oil/water/debris mixtures. All debris screening operations must be conducted within spill containment areas.

Commercial Separators Field portable commercial separators are available and may be utilized in the field separation of oil water mixtures. These units, while capable of high separation efficiency, typically require debris removal and have fairly low throughput rates.

Tank Truck Separation Recovered oil is often placed directly into vacuum or tank trucks. These tanks can be used for primary oil: water separation by allowing them sit undisturbed while the oil floats to the surface. Underlying water can then be decanted through the tank draw. The fill : decant process may be repeated until the tank is full. Decanting is conducted by opening the tank valve and releasing water until oil is discharged. Final decanting should be completed with caution, preferably into a container, to minimize the rise of spillage.

Tank / Impoundment Separation Baker or fractionation tanks, portable tanks (Quick tanks) or temporary lined impoundments may be setup in the field to conduct the separation process and act as temporary holding and transfer points. These types of temporary installations should be constructed with provisions for spill containment and minor spill cleanup.

Oil Drum Separation An oil / water separator can be constructed under field conditions using a 55 gallon drum or large welded sheet metal box fitted with a valved bottom drain. The oil / water mixture is pumped into the drum and allowed to stand long enough for gravity separation to be completed. The water is then decanted through the valve and the overlying oil removed.

An alternate method involves the use of a 55 gallon drum placed in an excavated sump. Holes are drilled in the sump near its base, and a large hole cut in the top. The sump is partially filled with water and the drum suspended upright and positioned such that the bottom 2/3 is submerged. The oil / water mixture is pumped into the drum at a rate slow enough to prevent the oil from being driven out the holes at the bottom. As the oil accumulates, it is removed by pumping or vacuum.

Logistics:

Logistical requirements determined by size and location of operation(s).