U.S. DEPARTMENT OF TRANSPORTATION
PIPELINE AND HAZARDOUS MATERIALS SAFETY ADMINISTRATION
SPECIAL PERMIT – Usage of FlexSteel Pipe

Special Permit Information:

Docket Number:	PHMSA-2021-0042
Requested By:	National Fuel Gas Supply Corporation
Operator ID#:	13063
Original Date Requested:	March 15, 2021
Original Issuance Date:	October 15, 2021
Effective Dates:	October 15, 2021 to October 15, 2031
Code Section(s):	49 CFR 192.53, 192.55, 192.105, 192.107, 192.109, 192.111, 192.113, 192.144, 192.149, 192.150, 192.327, 192.463, and 192.619

Grant of Special Permit:

By this order, subject to the terms and conditions set forth below, the Pipeline and Hazardous Materials Safety Administration (PHMSA), Office of Pipeline Safety (OPS),[1] grants this special permit to National Fuel Gas Supply Corporation (NFG) waiving compliance from 49 Code of Federal Regulations (CFR) 192.53, 192.55, 192.105, 192.107, 192.109, 192.111, 192.113, 192.144, 192.149, 192.150, 192.327, 192.463, and 192.619 for one (1) pipeline segment totaling approximately 12.58 miles of 6-inch diameter FlexSteel pipe and components on the FM120 Pipeline located in McKean, Elk, and Cameron Counties, Pennsylvania, as described below. This special permit is for use of FlexSteel pipe and components in a gas transmission Class 1 location and is inserted within a 12.75-inch diameter casing pipe. FlexSteel pipe is a type of flexible steel pipeline, which is not currently authorized for use in PHMSA-regulated gas transmission pipelines.

I. Purpose and Need:

This special permit grant is part of a modernization project which will allow NFG to use FlexSteel pipe

[1] Throughout this special permit the usage of "PHMSA" or "PHMSA OPS" means the U.S. Department of Transportation's Pipeline and Hazardous Materials Safety Administration Office of Pipeline Safety.

to retrofit a 12.75-inch diameter, 1950's vintage bare steel pipeline, known as the FM120 Pipeline. The new 6-inch diameter FlexSteel will be inserted through the existing 12.75-inch diameter pipeline, which will require significant maintenance and repair to continue to operate in pressurized natural gas service. Use of FlexSteel will significantly reduce excavation, earth disturbance, and other activities associated with removal of the existing 12.75-inch diameter steel pipeline and installation of a new steel pipeline into the right of way.

This special permit with conditions implemented by NFG will allow the use of FlexSteel pipe for this modernization project. The special permit will benefit NFG by allowing the replacement of approximately 12.58 miles of FM120 Pipeline (1950s vintage, 12.75-inch diameter, bare steel natural gas pipeline) through insertion of 6-inch FlexSteel pipe into the existing 12.58 miles of the FM120 Pipeline. NFG states that replacement will enhance the reliability and safety of NFG's FM120 Pipeline for the public, its shipper's distribution markets, storage and local production, and users of the state forest where the pipeline is routed. Upon completion, NFG will continue to provide the transportation services performed previously by the planned abandoned facilities, offering better connectivity for storage and transportation services. Furthermore, this special permit will benefit the public since much of the land is public land (Elk State Forest); the insertion process will greatly reduce the earth disturbance and amount of time required to complete the project as compared to the standard direct bury, or open trench type of construction.

II. Regulatory Background:

This special permit application request seeks a special permit (waiver) to use flexible steel pipe in a gas transmission pipeline that operates at a maximum allowable operating pressure (MAOP) of 720 pounds per square inch gauge (psig). NFG has requested a special permit (waiver) of the following 49 CFR 192 sections:

Section	Section Title	Discussion / Rationale
192.53	General	Sub-paragraph (c) does not recognize flexible steel pipe in meeting the requirements of the Subpart.
192.55	Steel Pipe	(a)(1) There is no listed specification for flexible steel pipe. (a)(2) Qualification requirements are specific to rigid steel pipe and do not apply to flexible steel.
192.105	Design formula for steel pipe	This section does not provide a design formula for flexible steel pipe.
192.107	Yield strength (S) for steel pipe	This section does not provide a design formula for flexible steel pipe and fittings.

192.109	Nominal wall thickness (t) for steel pipe	This section does not address the steel strip reinforcement used in flexible steel pipe.
192.111	Design factor (F) for steel pipe	This section does not provide design factors for flexible steel (FlexSteel) pipe.
192.113	Longitudinal joint factor (E) for steel pipe	This section does not apply to flexible steel pipe.
192.144	Qualifying metallic components	There is no listed specification for the swaged steel connectors to use with flexible steel pipe.
192.149	Standard fittings	There is no listed specification for flexible steel pipe connectors.
192.150	Passage of internal inspection devices	There is no need or value in running an inline inspection (ILI) tool since the internal wall of the FlexSteel pipe is thermoplastic instead of steel.
192.327	Cover	The existing 12.75-inch diameter steel pipeline will be used as a casing for the new 6-inch FlexSteel pipeline. Given that the existing line was installed in the mid-1950's, there are some areas with less than 30-inches to 36-inches of cover depending on the class location. However, the existing steel pipe, will serve as a casing for the FlexSteel line, thereby affording it an additional level of protection from 3rd party damage and from anticipated wheel loads.
192.463	External corrosion control: Cathodic Protection	This section envisions steel coated or bare pipe and does not contemplate externally high-density polyethylene (HDPE) lined steel materials. NFG will insert FlexSteel pipe into the existing 12.75-inch diameter pipeline, which will be cleaned prior to insertion (See Section VIII, **Condition 5.a.v** for pipeline cleaning procedure). NFG will direct bury and install a cathodic protection test station and anode in soil at every FlexSteel fitting outside the 12.75-inch diameter casing.
192.619	Maximum allowable operating pressure: Steel or plastic pipelines	This section does not provide a design formula for flexible steel pipe.

III. Special Permit Segment:

This special permit applies to the ***special permit segment*** defined as follows using the NFG FM120 Pipeline survey station references:

- ***Special permit segment***

  The ***special permit segment*** is defined as 66,406 feet (approximately 12.58 miles) of the FM120 Pipeline which is being replaced with a 6-inch diameter FlexSteel pipe inserted into an

existing 12.75-inch diameter pipeline.[2] The ***special permit segment*** is in McKean, Elk, and Cameron Counties, Pennsylvania. **Attachment 1A** through **1-D – FM120 Pipeline - Special Permit Segment Maps** shows the location of the ***special permit segment***. The ***special permit segment*** MAOP will be 720 psig.

PHMSA grants this special permit based on the findings set forth in the "Special Permit Analysis and Findings" and "Final Environmental Assessment and Finding of No Significant Impact" documents, which can be read in their entirety in Docket No. PHMSA-2021-0042 in the Federal Docket Management System (FDMS) located on the internet at www.regulations.gov.

IV. Conditions:

PHMSA grants this special permit subject to NFG implementing the following conditions on the ***special permit segment***. Each condition detailed in this section is applicable to the ***special permit segment*** unless otherwise noted in the condition.

1) NFG must design, operate, and maintain the pipeline in accordance with the following:

a) For purposes of the special permit, the ***"special permit segment,"*** or the "Project," is defined as the FlexSteel pipe, fittings, monitoring devices, and related facilities to be installed within the 12.58-mile section of the FM120 Pipeline. Other "new construction" will consist of those installations outside of the 12.58 miles of the ***special permit segment*** and are not included in this special permit.

b) The pipeline must operate at or below an MAOP of 720 psig. This MAOP has been established based on the pipeline facilities that connect to the ***special permit segment***, which are NFG's Line K, an interstate pipeline that spans between northern Pennsylvania and the Buffalo, New York areas, and Line KL, a pipeline that spans between Line K and the FM120 Pipeline.

c) The pipeline must operate at or below a design factor of 0.24 of the stated product burst rating of 3,000 psig, which is 48% of the product's 1,500 psig manufacturer pressure rating, for all class locations, and road crossings within the ***special permit segment***.

i) Due to the nature of the installation method, all road crossings must be cased with steel pipe. Any future road crossings using FlexSteel pipe must have a minimum of 36-

[2] NFG installed 30,624 feet (approximately 5.84 miles) of FlexSteel pipe on the FM120 Pipeline Mile Post 0.0 to 5.84 in 2019 under special permit docket PHMSA-2017-0090.

inches cover and must be cased or 49 CFR Part 192 compliant steel pipe must be installed.

ii) Due to the composite design of FlexSteel pipe, Barlow's formula in 49 CFR 192.105 cannot be used to determine the pressure rating of this material. Per American Petroleum Institute (API) 15S, Second Edition, Section 5.2.5, the maximum pressure rating for a product is equal to the product's calculated minimum burst pressure multiplied by a maximum design factor of 0.5. In this case, the 6-inch diameter FlexSteel pipe has a minimum burst pressure of 3,000 psig, which results in a maximum pressure rating of 1,500 psig.[3]

d) NFG must conduct quarterly patrols and instrumented leakage surveys at a maximum of 4-½ months, but at least four (4) times each calendar year in accordance with the requirements in 49 CFR 192.705, 192.706, and 192.935(d)(3) on the ***special permit segment***.

e) NFG must notify PHMSA of any of the following changes in the ***special permit segment***: class location changes, including increases or expansions in length, new high consequence areas (HCAs), and new moderate consequence areas (MCAs).

i) This special permit is not applicable for Class 3 and 4 locations, HCAs, MCAs, or for a Class 2 to Class 3 location increase as described in 49 CFR 192.611.

ii) The special permit conditions must be reviewed for class location modifications (49 CFR 192.609) to ensure Code compliance and safety are maintained. If a new building intended for human occupancy is identified within 197 feet (1.5 times potential impact radius [PIR]) of the ***special permit segment*** and that building causes a Class 1 location to become a Class 2 location, NFG will be required to remove and replace that portion of FlexSteel pipe with 49 CFR Part 192-compliant steel line pipe.

f) NFG must treat the ***special permit segment*** as if the entire segment is a covered segment in an HCA and must develop and follow an integrity management program in accordance with the requirements of 49 CFR Part 192, Subpart O (except as waived or modified herein) applicable to plastic transmission pipelines including the following sections: 49 CFR 192.901, 192.917(b) through (e), 192.921(a)(2) or (a)(4), 192.935, 192.937(c)(2) or (c)(4), and 192.939(b). This includes, but is not limited to, risk assessments, regular patrolling, participation in the national

[3] The 6-inch diameter FlexSteel pipe will be 5.60-inch inside diameter and 7.05-inch outside diameter with a rating of 1,500 psig, empty weight of 12.9 pounds per foot, maximum pipe operating temperature of 150 degrees Fahrenheit (°F), and maximum installation tension of 30,000 pounds.

one-call system, installation of remote controlled valves, and a pressure test re-assessment every seven (7) years or less, not to exceed 90 months, at a minimum pressure of 1.5 times MAOP for 24 continuous hours.

g) NFG must ensure that both its Integrity Management (IM) Procedures and its Operations & Maintenance (O&M) Procedures are modified to incorporate the conditions required by this special permit for the ***special permit segment***. NFG must make these portions of its IM Procedures and O&M Procedures available to PHMSA upon request.

2) General and Design Requirements

a) Branches: NFG must not tap, branch, or split the ***special permit segment*** FlexSteel pipe without the use of the appropriate FlexSteel manufactured fittings for the specified application.

3) Material and Testing Requirements

a) Pipe: All FlexSteel pipe must be newly produced after the grant of this special permit and not obtained from inventory. The outside HDPE layer is polyethylene (PE) 4710 with 2 to 3% dispersed carbon black content, Code C material in accordance with American Society for Testing and Materials (ASTM) D3350.

b) Pipe Layers: NFG must install line pipe in the ***special permit segment*** that is comprised of PE 4710 inner and outer layers made from natural gas pipe grade material, which meet the material requirements of API 15S, Second Edition. All FlexSteel components must be manufactured and tested in accordance with API 15S, Second Edition.

c) Regrind and Rework of Polymeric Materials: Materials used in the manufacture of the pipe installed within the ***special permit segment***, during construction or in future repairs or replacement, may not contain any regrind or rework material.

d) Outdoor Pipe Storage: NFG must comply with API 15S, Second Edition requirements for outdoor storage and ultraviolet radiation exposure of PE pipe for all FlexSteel pipe materials used in the ***special permit segment***. NFG must document compliance with API 15S, Second Edition in its Material Specifications and O&M Procedures. NFG must obtain mechanical and chemical properties test reports that certify the steel by heat used in manufacturing the FlexSteel pipe.

e) Factory Pressure Testing: All pipe used in the ***special permit segment*** must be factory pressure tested to a minimum of 1.3 times MAOP for a minimum of one (1) hour. NFG must make available pressure test records demonstrating that all ***special permit segment*** pipe was factory

pressure tested. Such records must be traceable to all line pipe repair or replacement pipe used within the ***special permit segment*** and must include: pressure test reports, pressure test parameters (pressure, time, procedure and/or standard number, date, test acceptance parameters, etc.), and pressure test recorders with current calibration records for pressure test recording equipment. NFG must provide a certification from the pipe manufacturer that the tests were completed and that all pipe was visually checked during the pressure tests for leaks. NFG must make available all pressure test records to the Director, PHMSA Eastern Region, prior to operation of the ***special permit segment*** upon request.

f) Testing of Steel: Two (2) pipe samples per unique steel heat used in the construction of the FlexSteel pipe's inner steel core placed into service must be obtained from the FlexSteel pipe inventory to be used in the actual construction project. For each sample, the following testing must be performed:
   i) Conduct burst testing at ambient temperature per the requirements of API 15S, Second Edition, Section 5.2.3.5;
   ii) The inner steel core must be destructively tested per ASTM A370 for yield strength, ultimate strength, and elongation. The results of the mechanical properties testing must be compared to the manufacturer's requirements for as-received steel strip materials;
   iii) The inner core chemical composition must be tested per ASTM A751. The results of the chemical composition must be compared to the manufacturer's material specifications; and
   iv) The HDPE material must be tested for chemical composition and compared to the manufacturer's material specifications.

g) Elevated Temperature Testing: One (1) sample obtained from FlexSteel pipe inventory, to be used in the actual construction project, must be subjected to elevated temperature testing per the requirements of API 15S, Second Edition, Section 5.4.3.2.

h) Long-Term Integrity: In designing the pipeline, NFG must consider and plan for all pipeline integrity risk factors, including, but not limited to: pressure and temperature cycling; performance of multilayer composite pipe in subzero temperatures, and repairs under a range of ambient conditions; long-term performance of composite material and mechanical fittings; cathodic protection of metallic appurtenances; coating performance; long-term performance of pipe; risk migration through damage to the inner or outer pipe wall; and methods for assessment of buried or excavated pipe.

i) NFG must schedule and perform five (5) inspections during which non-destructive and destructive testing must be performed on the pipe material after installation. Nondestructive testing must focus on the composition and degradation of the pipe material and destructive testing must include a hydrotest to burst pressure. NFG must perform these inspections and tests at a maximum of 1, 2.5, 5, 7.5, and 10-year intervals (not to exceed this timing by 90-days) after installation.

ii) A section of pipe no less than 200 feet must be installed in such a way that simulates the condition of the ***special permit segment*** (i.e., cased) in the immediate vicinity of the operating pipeline at Milepost 0 on or near NFG's property, see **Attachment 2-FM120 Pipeline Overview Map**. This FlexSteel pipe segment must have 20 feet removed during the intervals defined in **Condition 3(h)(i)** above to be evaluated, including destructive testing. The test results must be sent to the Director, PHMSA Eastern Region, and posted on the Federal Docket Management System (FDMS) located at www.regulations.gov.

(1) Each removed segment must be disassembled, visually, and non-destructively inspected, as appropriate, for any indications of corrosion.

(2) FlexSteel's internal and external HDPE layers must be destructively tested per ASTM D638-03 (Standard Test Method for Tensile Properties of Plastics) 2003 edition for yield strength, ultimate strength, and elongation. These properties must be evaluated based on the requirements of ASTM D2513-12ae1 (Standard Specification for Polyethylene (PE) Gas Pressure Pipe, Tubing, and Fittings) April 1, 2012 edition[4], Section 5.12.2.1 (Elongation) Table 1, and ASTM D3550-12e1 (Standard Specification for Polyethylene Plastics Pipe and Fittings Materials) April 1, 2012 edition, Table 1 (Yield Strength).

(3) Flex Steel's inner core must be destructively tested per ASTM A370-18 December 1, 2018 edition for yield strength, ultimate strength, and elongation and per ASTM A751-14a October 1, 2014 edition for chemical composition. These results must be evaluated based on the requirements of ASTM A109-16 (Standard Specification for Steel, Strip, Carbon (0.25 Maximum Percent), Cold Rolled) 2016 Edition Table 2 (Chemical Properties). The results of the

[4] NFG may use ASTM D2513-18a, August 1, 2018.

mechanical properties testing must be per the manufacturer's requirement for as-received steel strip materials. These mechanical property values must exceed the values listed in ASTM A109-16. Acceptance criteria is available for review upon request, but for trade secret reasons, it is requested that the criteria not be listed in the docket folder.

(4) A section of FlexSteel pipe must be burst tested per the requirements of API 15S, Second Edition, Section 5.2.3.5.

iii) Perform removal, replacement, and installation of pipe and fittings, and other actions related to the removal of test segments, in accordance with the requirements of this special permit.

iv) NFG must report the results of the inspections and tests to the Director, PHMSA Eastern Region, within 60 days of completion of testing.

v) In lieu of performing the testing requirements described in **Conditions 3(h)(i), 3(h)(ii), 3(h)(iii), and 3(h)(iv)** of this special permit, and since the ***special permit segment*** will be connected to the ***special permit segment*** installed under Docket No. PHMSA-2017-0090, NFG may use the results of the destructive and non-destructive testing as required in **Condition 3(e)** of Docket No. PHMSA-2017-0090 to determine the long-term integrity of the pipeline. Any results from the analysis of these tests that require corrective action(s) shall be applied to the ***special permit segment***.

4) Construction Operator Qualifications

a) If the performance of a task associated with construction or repair of the ***special permit segment*** could affect the integrity of the segment, NFG must treat that task as a "covered task" notwithstanding the definition in 49 CFR 192.801(b), and must implement the requirements of 49 CFR Part 192, Subpart N. NFG's construction operator qualification (COQ) procedures, training program, and qualification tests must include detailed information on all construction-related tasks as a covered task.

b) NFG must develop and implement a COQ plan that specifically relates to construction activities for the ***special permit segment***. The purpose of the plan is to ensure construction personnel and operations personnel are trained. The COQ plan must be followed throughout the construction phase with respect to the following: pipe inspection, hauling and stringing, appurtenance inspection, field jointing methods, installation of pipe and appurtenances, pull through of the pipeline, padding and backfilling as required, hydrostatic testing, pipe repairs

made from hydrostatic testing, dewatering and purging, and inspection of work (i.e. trenching, excavating, etc.). These tasks can affect the integrity of the ***special permit segment*** and must be treated as "covered tasks." The individuals driving the pipe trucks to the pipeline right-of-way will not need to be COQ qualified, unless they are responsible for the pipe unloading.

c) For the ***special permit segment,*** NFG must treat tasks such as: right-of-way soil stability determination, surveying, locating foreign lines, locating the pipeline for one call notifications, ditching or excavation, cathodic protection (CP) system surveys, mitigation, installation, anomaly evaluations and repairs, right of way clean up, installation of line markers, supervisory control and data acquisition (SCADA) control point installation and verification, gas quality monitoring, and construction quality assurance monitoring, as covered COQ or OQ tasks.

d) NFG must have FlexSteel personnel on-site when initial pipeline installation (unrolling and insertion activities) is conducted.

   i) NFG must have FlexSteel certified joining personnel onsite installing all FlexSteel couplings.

e) NFG must develop and make available its COQ plan to the Director, PHMSA Eastern Region, 30 days prior to beginning construction.

5) Excavation, Pipe Cover, and Damage Prevention

a) Pipe - Inspection for Damage:

   i) NFG must develop and implement an inspection training and qualification plan and must send a copy of the plan to the Director, PHMSA Eastern Region, 30 days prior to the start of construction. This plan must define the requirements and training necessary to inspect and evaluate damage to FlexSteel pipe and fittings. In addition, NFG must have FlexSteel employees on site during any unrolling or insertion activities not only to advise on any construction related activities but to assist in inspection, evaluation, and repair of any damage indications, should these be encountered.

   ii) NFG must inspect the pipeline during offloading at the storage yard, offloading on location, during uncoiling, placement into the ditch, backfill, right-of-way grading, and clean up.

   iii) NFG must certify and document all inspections with date, time, pipeline station, and pipe spool number.

iv) NFG must inspect the leading 25 feet of pull-through pipe for damage, replacing damaged pipe. All indications of pipe damage must be evaluated and replaced or repaired as follows:

(1) Option 1 - Minimal Damage to the Pipe Shield: Gouges or scrapes that exceed 0.1181 inches or 3 millimeters (mm) in depth must be repaired in accordance with Option 2 or 3 below or replaced with new pipe.

(2) Option 2 - Moderate Damage to the Pipe Shield with No Steel Strip Exposed: Gouges more than the depth specifications listed above must be repaired with either a pipe clamp or a pipe repair system consisting of polyethylene/butyl rubber pipeline tape, heat-activated wrap, or replaced with new pipe. Prior to applying the clamp or wrap, gouges must be smoothed and blended with an appropriate grit sandpaper or equivalent material. For this repair option to be used, the pipe must contain: no visible evidence of exposed steel layers, outer sheath damage must be less than six (6) square inches, and the outer sheath damage cannot be more than halfway around the pipe.

(3) Option 3 - Extensive Damage to the Pipe Shield: When the steel layer has become exposed or the degree of outer sheath damage exceeds the parameters specified in Option 2 above, the damaged section of the pipe must be cut out and a midline connection installed.

v) During the pre-installation, the operator must develop procedures for internally cleaning the existing 12.75-inch diameter pipe (future casing pipe) to remove liquids and debris and to inspect the casing pipe for any hazards that could damage the FlexSteel pipe during the pull through.

vi) Prior to insertion, each insertion section of the ***special permit segment*** must be pigged with a cleaning pig to verify the cleanness of the section. If any liquids are found as a result of this cleaning pig run, additional cleaning pig runs must be performed until no visible liquids are found.

vii) During the insertion process, the tensile force on the FlexSteel pipe shall be monitored using a calibrated dynamometer, calibrated within six (6) months of use. This tensile force shall be limited to 24,000 pounds which is 80% of FlexSteel's rating of 30,000 pounds.

b) NFG must develop and implement O&M Procedures and/or Construction Specifications to remove and replace any FlexSteel pipe with the following conditions:
   i) Cuts, scrapes, abrasions, or gouges that at any place exceeds the criteria for wall damage defined in **Condition 5(a)**.
   ii) Discolorations of the outer HDPE layer that may indicate material degradation or lack of homogeneity.
   iii) All FlexSteel pipe must be newly produced after the grant of this special permit and not obtained from inventory. The outside HDPE layer is PE 4710 with 2 to 3% dispersed carbon black content, Code C material in accordance with ASTM D3350.
   iv) In the event that crazing is identified and is less than 0.07874-inches (2 mm) in depth in the pipe, NFG does not need to perform additional assessments as there will be no anticipated adverse effects on the pipe. Any damage equal to or greater than 0.07874-inches (2 mm) in depth, NFG must provide a more detailed assessment to determine the appropriate mitigative measures, up to and including replacement.[5] NFG must perform laboratory testing to determine any widespread materials issue with the pipe.
   v) NFG must not install any FlexSteel pipe above grade (ground).
c) Other possible signs of material damage or unsoundness must be reviewed by qualified personnel, and if the integrity of the FlexSteel pipe is negatively affected, NFG must remove and replace such pipe.
d) NFG must document its repair and replacement procedures and standards within the comprehensive written specifications or standards required under 49 CFR 192.303 and the O&M Procedures required in 49 CFR 192.605.
e) NFG must hand dig whenever excavation operations are within two (2) feet of the pipeline and when installing communication lines for monitoring devices.
f) NFG must prepare and follow a damage prevention program in accordance with 49 CFR 192.614. NFG must make this program part of its O&M Procedures prior to placing the ***special permit segment*** in natural gas service.
g) NFG must ensure that the ***special permit segment*** will comply with the requirements in 49 CFR Part 192, except as waived or modified herein as listed in Section II – Regulatory Background.

[5] NFG and FlexSteel believe crazing and cracking will be unlikely for this project.

6) Corrosion Control

a) NFG must apply cathodic protection (CP) on all buried FlexSteel pipe components, and joints within the ***special permit segment*** in accordance with 49 CFR Part 192 (except as waived or modified herein). Electrical conductivity of swaged joints to inner pipe layer must be tested.

i) Each FlexSteel fitting must be installed with an anode and CP test station. These fittings are electrically conductive with the FlexSteel pipe inner steel core.

b) NFG must install CP test stations at each metallic connector.

c) NFG must perform external corrosion control monitoring on each buried metallic fitting in accordance with 49 CFR 192.465. NFG must perform CP monitoring at least once each calendar year, not exceeding 15 months. Corrosion control monitoring of the buried metallic fittings by a sampling basis is not permitted.

i) Each stainless steel and carbon steel FlexSteel fitting must be installed with a test station and anode, coated and direct buried.

d) NFG must determine the native structure-to-electrolyte potential for each buried metallic fitting prior to energizing the CP system.

e) NFG must seal the 12.75-inch casing ends to prevent water and other debris from entering the casing annulus.

f) NFG must ensure that no 12.75-inch casing end, where natural gas can leak or migrate to the soil surface, is within the 6-inch FlexSteel pipe PIR (minimum of 131 feet) of a dwelling for human occupancy for the life of the special permit.

g) NFG must develop and implement Construction and O&M Procedures to identify non-isolation areas and maintain electrical isolation of the FlexSteel pipe inner steel core from contact with the steel casing pipe and from water entering the inner steel core.

7) Pressure and Temperature Control and Monitoring

a) NFG must install an annulus monitoring system that will provide continuous integrity monitoring of the external HDPE layer. If a holiday is present on the external layer, this system will detect this defect.

i) NFG must continuously monitor through SCADA the pressure of the annulus space between the FlexSteel pipe HDPE layers along the "entire ***special permit segment***." These pressure monitoring transmitters and pressure vents must be located at valve settings at Mile Post 9.4 and Mile Post 12.58, see **Attachment 1A** through **1D - FM120 Pipeline - Special Permit Segment Maps**.

ii) The annulus between inside liner and outer jacket HDPE materials is used to monitor pipe integrity. This annulus is a pressure containing capable structure that is designed to contain pressure up to 30 psig. National pipe thread (NPT) 1/8-inch female outlets on the end fittings will be outfitted with the necessary tubing to attach pressure transmitters that must be incorporated into SCADA monitoring. With permeated gasses permitted to build to a predetermined level (15 to 20 psig), transmitters will be configured to alarm on indications of high or low pressure outside of the established acceptable range. Continuous pressure readings within acceptable ranges provide real time indication that several key integrity features are functioning as designed. Positive pressure indicates the outer jacket material is intact (holiday free), demonstrating a "perfect coating", thus external corrosion cannot occur. It indicates that the HDPE liner material is intact and containing bore gas pressure as intended. Any breach of the liner will expose the outer jacket to bore pressure, resulting in a loss in pressure indicated by the "real time" annulus monitoring. This monitoring will alert NFG that damage to the pipeline or liner failure may have occurred, allowing prompt response for further investigation. NFG will use this monitoring capability and monitor this annular pressure with a SCADA system on a continuous 24-hour basis.

iii) The FlexSteel fittings must be designed to allow the annulus of each segment of pipe to be common with each other, so that monitoring of the annular space can be conducted at one end of the system.

iv) A pressure relief valve with an 18 psig set point must be installed with annulus monitoring equipment to maintain the 15 to 20 psig pressure range. This relief and the associated annulus monitoring equipment must be located within a fenced in location at Mile Post 12.58.

b) Over-pressure Protection: NFG must install over-pressure protection equipment necessary to keep the pipeline pressure from exceeding 720 psig plus allowable build-up at any time. Allowable build ups are those conditions which occur due to anomalous conditions outside of the ***special permit segment***. Occurrences resulting in pressures exceeding 720 psig plus allowable build-up of MAOP plus 4%, must be reported to the Director, PHMSA Eastern Region, within 24 hours or the next business day of the occurrence for review.

c) Pressure Monitoring: NFG must monitor operating pressures by the installation of pressure transmitters and switches in the piping system that report to the facility's SCADA system.

NFG must monitor the ***special permit segment*** with continuous and redundant pressure transmitters and switches. NFG must provide a means to inform operator personnel performing work on the pipeline of the pressure on the line.

d) Gas Temperature: NFG must continuously monitor natural gas temperature at the discharge of NFG's Wellendorf Compressor Station, see **Attachment 1-A** through **1D – FM120 Pipeline - Special Permit Segment Maps,** in order that the pipeline is not exposed to temperatures exceeding 150 degrees Fahrenheit (°F). If the FlexSteel pipe is exposed to temperatures exceeding 150 °F, the ***special permit segment*** pipeline must be shut down, pressure reduced to a maximum of 20% below the current operating pressure, and the Director, PHMSA Eastern Region, must be contacted within two (2) working days of the time the temperature exceedance was detected.

e) SCADA and Shut-In:

i) NFG must continuously monitor the ***special permit segment*** with a SCADA system. Remote controlled valves must be installed within the vicinity of Milepost 12.58.

(1) **Attachment 2 – FM120 Pipeline Overall Map**, NFG has an existing remote control valve (RCV) installed at Mile Post 1.2 of ***special permit segment*** described in Docket No. PHMSA-2017-0090 and must install an additional RCV at Mile Post 12.58 which will protect approximately 17.1 miles of Class 1 and all of the ***special permit segment***.

ii) If communication is lost for over three (3) hours, NFG must have personnel onsite to continue operations and monitoring of the ***special permit segment***.

iii) NFG must document SCADA operating procedures and Control Room Management Procedures (49 CFR 192.631), within the O&M Procedures for the ***special permit segment***.

8) Construction and Operations

a) Tools and Equipment: NFG must have tools and fittings available either by stocking such or from a local vendor such that it can respond within a reasonable time to operational maintenance and emergency repairs (the number and types must be detailed in the O&M Procedures):

i) An inventory of tools and materials must be identified in the O&M Procedures for maintenance and emergency repairs.

ii) NFG must have available either by stocking such or from a local vendor appropriate tools and fittings to repair and replace appurtenances and piping within the ***special permit segment***.

iii) NFG must maintain a supply of FlexSteel pipe at NFG's project and/or operational maintenance yards for the ***special permit segment***.

iv) Construction Specifications: NFG must develop construction specifications for all construction phases of the ***special permit segment***. These construction specifications must be made available to the Director, PHMSA Eastern Region, 30 days prior to beginning construction of the ***special permit segment*** pipeline.

b) Inspection criteria: NFG must develop inspection criteria for construction procedures and document the criteria within the O&M Procedures. The inspection criteria must meet the requirements of these special permit conditions and 49 CFR Part 192 (except as waived or modified herein). These inspection criteria must be made available to the Director, PHMSA Eastern Region, 30 days prior to beginning construction of the ***special permit segment*** pipeline.

c) Repair criteria: NFG must develop pipe repair criteria and document the criteria within the O&M Procedures. Repair criteria must be submitted to the Director, PHMSA Eastern Region, 30 days prior to beginning construction of the ***special permit segment*** pipeline.

d) Hydrostatic test: Prior to NFG putting the pipe in service, the pipe, connections, and appurtenances must be field hydrostatically tested at a pressure of 1.5 times the MAOP of 720 psig (minimum test pressure of 1080 psig) for a minimum of 24 hours with recording charts (pressure chart, temperature chart, dead weights and log, and calibration records of equipment, calibrated within 30 days of test), the results of which must be made available to the Director, PHMSA Eastern Region, for review, including determination parameters of an acceptable test. NFG must compensate for temperature and elevation variations and such compensation must be documented on test records.

e) Leakage detection surveys: NFG must conduct leakage detection surveys of the entire ***special permit segment*** four (4) times per calendar year at a minimum, not to exceed 4-½ months between surveys, utilizing instrumented leak detection equipment capable of parts per million (ppm) detection. NFG must repair each leak when it is discovered, and notify the Director, PHMSA Eastern Region, of any leaks found within two (2) business days. Leak testing procedures, equipment, and scheduling must be documented within the O&M Procedures.

The first survey must be performed within 48 hours of commencement of pipeline operations with natural gas.

f) As defined in **Condition 1**, any new construction outside the ***special permit segment*** must conform to 49 CFR 192.327 - Cover.

   i) NFG must conform to the depth of cover requirements in 49 CFR 192.327 for any new construction outside of the ***special permit segment***.[6]

   ii) Based upon available depth of cover information, the depth of cover of the existing pipeline may not meet 49 CFR 192.327 requirements depending on soil conditions (i.e., Class 1 locations in consolidated rock may be installed at a depth of cover of 18-inches per 49 CFR 192.327 as opposed to an installation depth of cover of 30-inches in normal soil). All pipe locations with cover less than 24-inches must have additional preventive and mitigative measures such as additional pipeline markers, lowering the pipe, adding cover, or installing subsurface concrete safety barriers. NFG must submit to the Director, PHMSA Eastern Region, the type of preventive and mitigative measures proposed for use on all pipe and casing segments with cover less than 24-inches, and must receive a "no objection" letter for the proposed measures.

   iii) Due to the insertion method, periodic bell holes will be dug, and sections of the existing pipeline will be removed to facilitate the installation process. In these areas, the FlexSteel coupler fittings will be direct buried, along with the adjacent FlexSteel pipe. To minimize environmental impacts, the bell holes will be kept to a minimum length that will allow for the safe installation of the FlexSteel pipe. The expected length of the bell holes is anticipated to be approximately 100 feet long. NFG must install the FlexSteel coupler fittings to a depth that satisfies 49 CFR §192.327, where possible. To mitigate any potential impingement of the outer FlexSteel liner or damage to the casing Link-seal, NFG may need to bury the FlexSteel pipe and fittings up to the depth of cover of the existing line.

[6] A primary objective of NFG's special permit request was to capitalize on the opportunity to perform the construction via the insertion method to avoid the significantly higher level of environmental impact that will be necessitated by using the open trench construction method. Inherent in this request was utilization of the existing 12.75-inch diameter pipeline as a casing or host pipe into which the FlexSteel pipe will be inserted. This pipe is a pre-1970's vintage pipeline. Its installation was before Part 192 was developed, and there are locations that do not meet depth of cover requirements.

iv) These areas must have line markers and/or test stations installed to designate the location of the line. Warning tape must also be installed approximately one (1) foot above the pipe.

v) At locations where it is possible to lower the FlexSteel pipe without the potential of impingement of the outer liner, NFG must install the pipe at a depth per the requirements of 49 CFR 192.327.

vi) NFG must perform patrolling of this line four (4) times per calendar year at a minimum, not to exceed 4-½ months between surveys. The patrols must be in accordance with 49 CFR 192.705(a) and (c) and include observations of any locations that may have become exposed. These exposures must be reviewed and prioritized for remediation per NFG's O&M Procedures but shall not exceed 12 months from discovery of the exposed pipe.

9) Communication and Records

a) Communication and contact of personnel: NFG must maintain a log of all material suppliers and vendors, consultants, subcontractors, NFG employees, and all other parties involved in the material supply, design, construction, and O&M of this ***special permit segment*** with name, address, phone number, mobile phone number, e-mail, and other pertinent information, including COQ and operator qualification (OQ) training data.

b) Photos and Videos: NFG must develop documentation that is representative of the following phases of the ***special permit segment*** construction utilizing FlexSteel pipe and fittings: offloading, stringing/uncoiling, inserting, pulling-through, joining/swaging, coating of fittings, cathodic protection installation and backfilling. The representative phases of construction must be documented with photographs, videos, or other appropriate forms of documentation, which must be made available upon request to the Director, PHMSA Eastern Region, within 90 days of the ***special permit segment*** in-service date.

c) Design and Material Review: Before operating the pipeline with natural gas, NFG must make available the following information, to the Director, PHMSA Eastern Region:

i) Specific materials of the FlexSteel line pipe used in the ***special permit segment***, with detailed schematic of the layers, layer thickness, outside diameter, and inside diameter;

ii) Pipe manufacturing quality assurance processes and programs including, but not limited to, procedures, pipe and material test results, standards followed, certifications, manufacturing personnel qualifications, and any other items regarding quality assurance;

iii) Design criteria for each Class location, road crossings, and stream crossings, if applicable, see **Conditions 1(b) and (c)** above;

iv) Calculations of maximum loads that the FlexSteel pipe can tolerate and will be subject to in service;

(1) Due to the nature of the installation method, most of the installed FlexSteel pipe will be inserted into the existing pipe, which includes pipe at all road crossings.[7]

(2) NFG must require any planned third-party heavy equipment crossings of the ***special permit segment*** to be approved through an encroachment agreement. All heavy equipment crossings of the ***special permit segment*** must include the requirement for the crossing to have construction hardwood mats, steel plates, air bridges, or concrete pads over the segment installed prior to traversing the pipeline. NFG must ensure that excessive live loads are not transmitted into the Flex Steel pipe by following industry accepted standard API 1102 (latest edition) for calculating the anticipated stresses on the pipe not to exceed a 30% of burst pressure and evaluated by a NFG subject matter expert.

v) Process and calculations used to establish MAOP, consistent with this special permit and 49 CFR Part 192 (except as waived or modified herein); and

vi) Detailed comparison and correlation of the established MAOP with the hydrostatic design basis (HDB) of the FlexSteel pipe.

d) Construction Start: At least 14 days before beginning construction, NFG must notify the Director, PHMSA Eastern Region, of the date, time, and location of pipeline installation.

e) Material Records: NFG must create and maintain records showing manufacturer personnel and a Quality Assurance (QA)/Quality Control (QC) inspector were onsite conducting inspections during installation of all connections, flanges, and the laying of pipe to ensure that proper technical evaluation of installation procedures was conducted. Mechanical and chemical property test reports of all pipe must be maintained by NFG for the operational life of the pipeline.

f) Pipe Installation Records: NFG must create and maintain an installation report detailing any Construction or QA/QC issues that arose during installation that may have compromised the

[7] There will be some short locations of direct burial located at transitions to above grade valve settings as well as locations where the midline couplings will be direct buried approximately every 1,200 feet. NFG anticipates the largest load that the FlexSteel pipe would experience will be from a mowing tractor.

integrity of the pipe and document how such issues were addressed to maintain the FlexSteel pipe integrity, including but not limited to:

i) Material damage - material loss or damage that will result in repair or replacement, both internal and external;

ii) Pipe dents - maximum dent percentage that pipe can sustain, and repair methods;

(1) Dents greater than 6% of outside pipe diameter must be removed and replaced.

iii) Any scratch or gouge:

(1) Less than 0.11811-inches (3 millimeters (mm)) in depth is acceptable;

(2) Equal to or more than 0.11811-inches (3 mm) but does not expose the inner steel core and is less than six (6) square inches in area must be repaired;

(3) Equal to or more than 0.11811-inches (3 mm) in depth but does not expose the inner steel core and is equal to or more than six (6) square inches in area must be cut out and replaced; or

(4) That exposes the inner steel core must be cut out and replaced.

iv) Bending - maximum pipe bending radius during installation; and

v) Environmental effects - temperature, moisture, freezing, or soil.

g) If at any time NFG becomes aware of a threat to the integrity of the ***special permit segment*** pipe that poses a risk to the public, or a failure risk, NFG must notify the Director, PHMSA Eastern Region, immediately. Concurrent with such notification, NFG must outline the potential mitigative and integrity measures that could be used to address the threat or risk, including replacement with steel line pipe currently approved by 49 CFR Part 192.

h) NFG must notify the Director, PHMSA Eastern Region, within five (5) days if:

i) Repairs and modifications are required or made to the FlexSteel pipe, including fittings;

ii) The ***special permit segment*** is at any time damaged or hit; or

iii) The pipe or fitting manufacturer issues a product recall, or materially modifies the product defect specification in response to safety concerns. In the event of a product recall or material defect pertaining to the FlexSteel products used in the ***special permit segment***, NFG must notify the Director, PHMSA Eastern Region, within five (5) days of becoming aware of the recall or material defect.

i) Manuals - Design, Construction, Operating, Maintenance, and Emergency Response: NFG must submit those manuals, procedures, specifications, or other documents pertaining to the Design, Construction, O&M, and Emergency Response related to the ***special permit segment*** for review

by the Director, PHMSA Eastern Region, at least 30 days prior to construction and operation of the ***special permit segment*** pipeline, unless otherwise indicated in writing by the Director, PHMSA Eastern Region.

j) Post-Construction review with PHMSA:
   i) NFG must conduct a post-construction special permit review with the Director, PHMSA Eastern Region to demonstrate, through documentation, NFG's compliance with all construction-related special permit conditions and identify the information that has been incorporated into NFG's O&M Procedures. NFG must contact the Director, PHMSA Eastern Region, within 14 days **before** completion of construction of the pipeline. The review must take place after construction has been completed but before operation commences, unless otherwise approved by the Director, PHMSA Eastern Region.
   ii) NFG must complete this review prior to submitting to PHMSA the certification required in **Condition 13** below.

k) Annual Review with PHMSA: NFG must conduct a one (1) year O&M review with PHMSA and annually thereafter, not to exceed 15 months. The review must be scheduled each calendar year by NFG with the Director, PHMSA Eastern Region, after the ***special permit segment*** is in operation.

10) Gas Quality

a) NFG must develop and implement a program to monitor and mitigate the presence of deleterious gas stream constituents through the usage of continuous monitoring equipment, such as chromatographs, for gas sampling.

b) NFG's Supply Transmission System must maintain a tariff with gas quality requirements for the gas flowing through the ***special permit segment***. These requirements are as follows:[8]
   i) All gas must contain no more than twenty (20) grains of total sulfur (S), no more than three-tenths (0.3) grain of hydrogen sulfide (H_2S) per one hundred (100) cubic feet;
   ii) All gas must contain no more than two-tenths of one percent (0.2 of 1%) by volume of oxygen (O_2);
   iii) All gas must contain no more than four percent (4%) by volume of a combined total of carbon dioxide (CO_2) and nitrogen (N_2) components; provided, however, that the total carbon dioxide (CO_2) content must not exceed two percent (2%) by volume;

[8] NFG's Supply Transmission System is a Federal Energy Regulatory Commission (FERC) regulated pipeline system. NFG is required to maintain a tariff with gas quality requirements for shippers to meet.

iv) All gas must have a temperature of not more than one hundred twenty degrees Fahrenheit; and

v) All gas must have been dehydrated by NFG for removal of water in a vapor state, and in no event, contain more than seven (7) pounds of water vapor (H_2O) per million cubic feet.

c) This gas composition requirement must be within the specification for the FlexSteel material being used for the ***special permit segment***.

d) NFG must actively monitor the gas entering its system to ensure the gas being transported meets this gas quality standard. NFG must monitor the gas quality passing through this ***special permit segment*** and the gas composition must be analyzed on a semi-annual basis.

e) If the gas composition has been found to be out of specification, the gas supply to the ***special permit segment*** must be shut off per NFG O&M Procedures.

f) If it is determined that the gas transported in the ***special permit segment*** is not compatible with and proves detrimental to the pipe material, PHMSA reserves the right to revoke, suspend, or modify this special permit.

11) Right-of-Way Management Program

a) NFG must incorporate the applicable best practices of the Common Ground Alliance (CGA) into its damage prevention program within the ***special permit segment***.

b) NFG must install and maintain line-of-sight markings on the pipeline in the ***special permit segment*** except in agricultural areas or large water crossings such as lakes where line-of-sight signage is not practical.

12) Annual Reporting

Annually, following the grant of this special permit, NFG must make available the following to the Director, PHMSA Eastern Region:

a) The number of new residences, other structures intended for human occupancy and public gathering areas built within 220 yards of the pipeline centerline and along the ***special permit segment***.

b) Any new integrity threats identified during the previous year and the results of any excavations or other integrity assessments performed during the previous year in the ***special permit segment*** including any encroachments from right-of-way patrols, gas leakage patrols, or other call-outs, and any gas leakage from these activities or from SCADA monitoring or annulus monitoring pressures greater than 20 psig.

c) Any reportable incident, any leak normally indicated on the DOT Annual Report, and all repairs on the pipeline that occurred during the previous year in the ***special permit segment***.

d) Any on-going damage prevention initiatives affecting the ***special permit segment*** and a discussion of the success of the initiatives.

e) Any mergers, acquisitions, transfer of assets, or other events affecting the regulatory responsibility of the company operating the pipeline.

f) NFG must identify and document any potential threats, and how they will be mitigated. If a threat was identified in a past annual report, how the threat was mitigated must be documented.

g) Annual reports must be received by PHMSA by the last day of the month in which the special permit is dated. For example, the annual report for a special permit dated September 15, 2021, must be received by PHMSA no later than September 30, each year beginning in 2022. Annual reports must be placed on the special permit docket in www.regulations.gov.

13) Certification

A senior executive officer of NFG, vice president or higher, must certify in writing the following:

a) NFG pipeline meets the conditions described in this special permit and 49 CFR Part 192 (except as waived or modified herein) for the ***special permit segment***.

b) NFG has maintained the following records for the ***special permit segment*** and included these requirements in NFG's O&M Procedures:

   i) Documents (material test reports) certifying that the pipe in the ***special permit segment*** meets the requirements of API 15S, Second Edition and all related material standards in this special permit and 49 CFR Part 192 (except as waived or modified herein).

   ii) Documentation of compliance with all conditions of this special permit must be retained for the applicable life of this special permit for the referenced ***special permit segment***.

c) That all procedures and specifications for the NFG pipeline have been updated to include all additional construction, and O&M requirements of this special permit and 49 CFR Part 192 (except as waived or modified herein) applicable sections; and

d) That NFG has reviewed and modified its damage prevention program relative to this ***special permit segment*** pipeline to include any additional conditions required by the special permit.

e) NFG must send the certifications required in **Condition 13 (a) through (d)** with completion date, compliance documentation summary, and the required senior executive signature and date of signature to the PHMSA Associate Administrator with copies to the Director, PHMSA Eastern Region; Director, PHMSA Engineering and Research Division; and to the Federal

Register Docket (PHMSA-2021-0042) at www.regulations.gov within 30 days prior to placing the ***special permit segment*** into natural gas service.

V. Limitations:

This special permit is subject to the limitations set forth in 49 CFR 190.341 as well as the following limitations:

1) PHMSA has the sole authority to make all determinations on whether NFG has complied with the specified conditions of this special permit. Failure to comply with any condition of this special permit may result in revocation of the permit and require NFG to comply with the regulatory requirements.
2) Any work plans and associated schedules for the FM120 Pipeline ***special permit segment*** are automatically incorporated into this special permit and are enforceable in the same manner.
3) Failure by NFG to submit the certifications required by **Condition 13 (Certification)** within the time frames specified may result in revocation of this special permit.
4) As provided in 49 CFR 190.341, PHMSA may issue an enforcement action for failure to comply with this special permit. The terms and conditions of any corrective action order, compliance order or other order applicable to a pipeline facility covered by this special permit will take precedence over the terms of this special permit.
5) If NFG sells, merges, transfers, or otherwise disposes of all or part of the assets known as the FM120 Pipeline in the ***special permit segment***, NFG must provide PHMSA with written notice of the change within 30 days of the consummation date. In the event of such transfer, PHMSA reserves the right to revoke, suspend, or modify the special permit if the transfer constitutes a material change in conditions or circumstances underlying the permit.
6) PHMSA grants this special permit for a term of 10 years from the date of issuance. If NFG elects to seek renewal of this special permit, NFG must submit its renewal request at least 180 days prior to expiration of the 10-year period to the PHMSA Associate Administrator for Pipeline Safety with copies to the Director, PHMSA Eastern Region; and the Director, PHMSA Engineering and Research Division. All requests for a renewal must include a summary report in accordance with the requirements in **Condition 12 (Annual Report)** above and must demonstrate that the special permit is still consistent with pipeline safety. PHMSA may seek additional information from NFG prior to granting any request for special permit renewal.

AUTHORITY: 49 U.S.C. 60118 (c)(1) and 49 CFR 1.97.

Issued in Washington, DC on October 15, 2021.

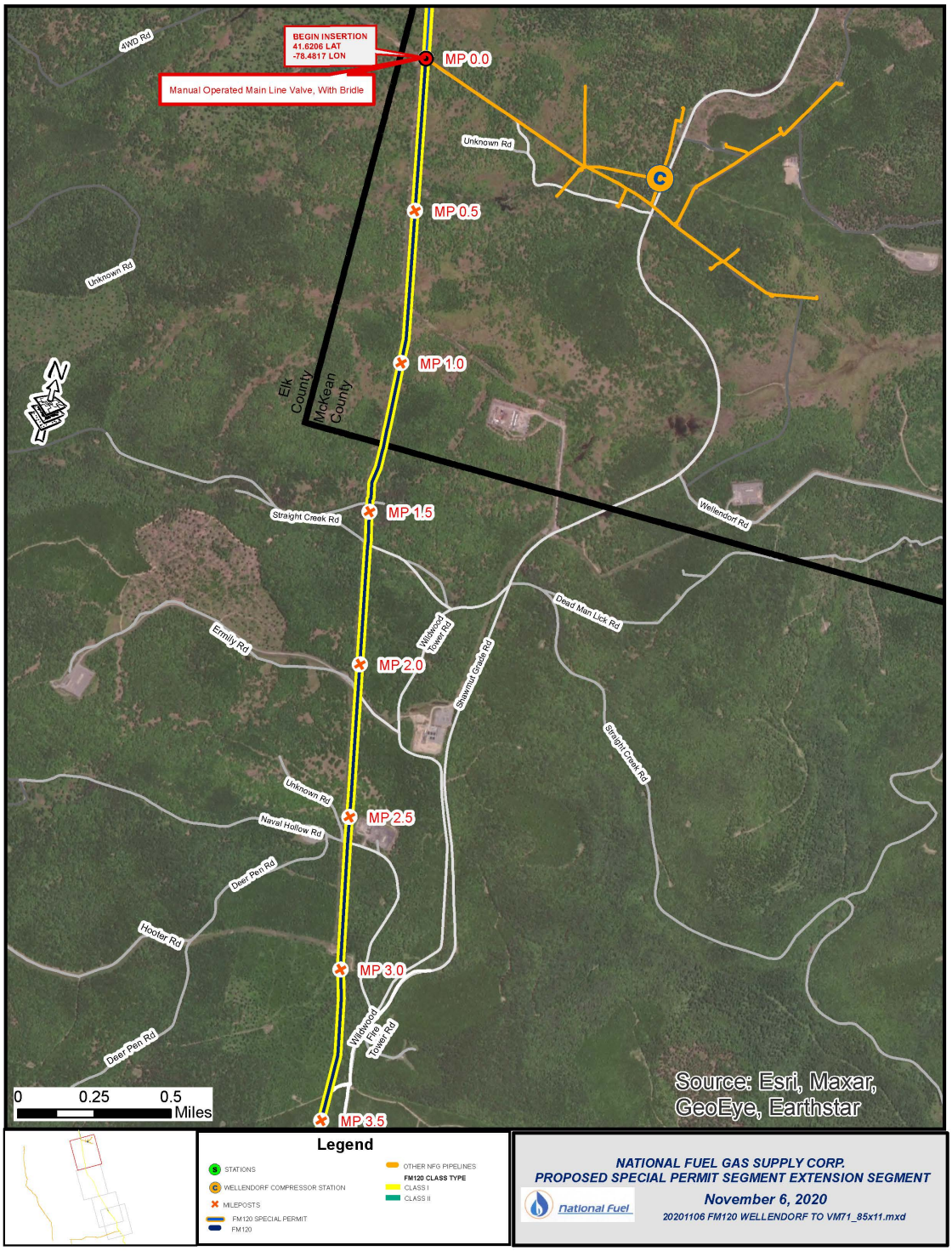
ALAN KRAMER MAYBERRY

Digitally signed by ALAN KRAMER MAYBERRY
Date: 2021.10.15 17:08:34 -04'00'

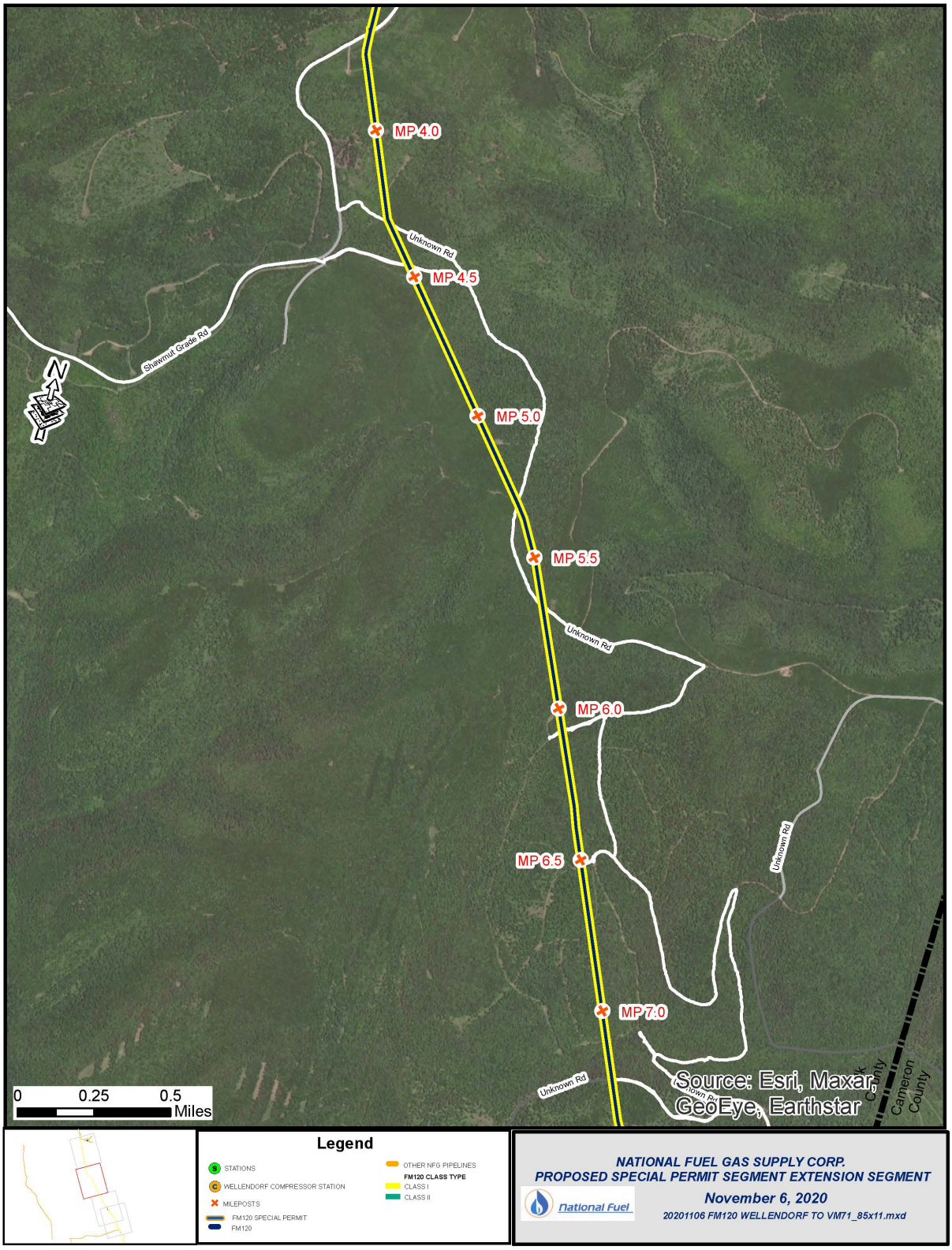
Alan K. Mayberry,

Associate Administrator for Pipeline Safety

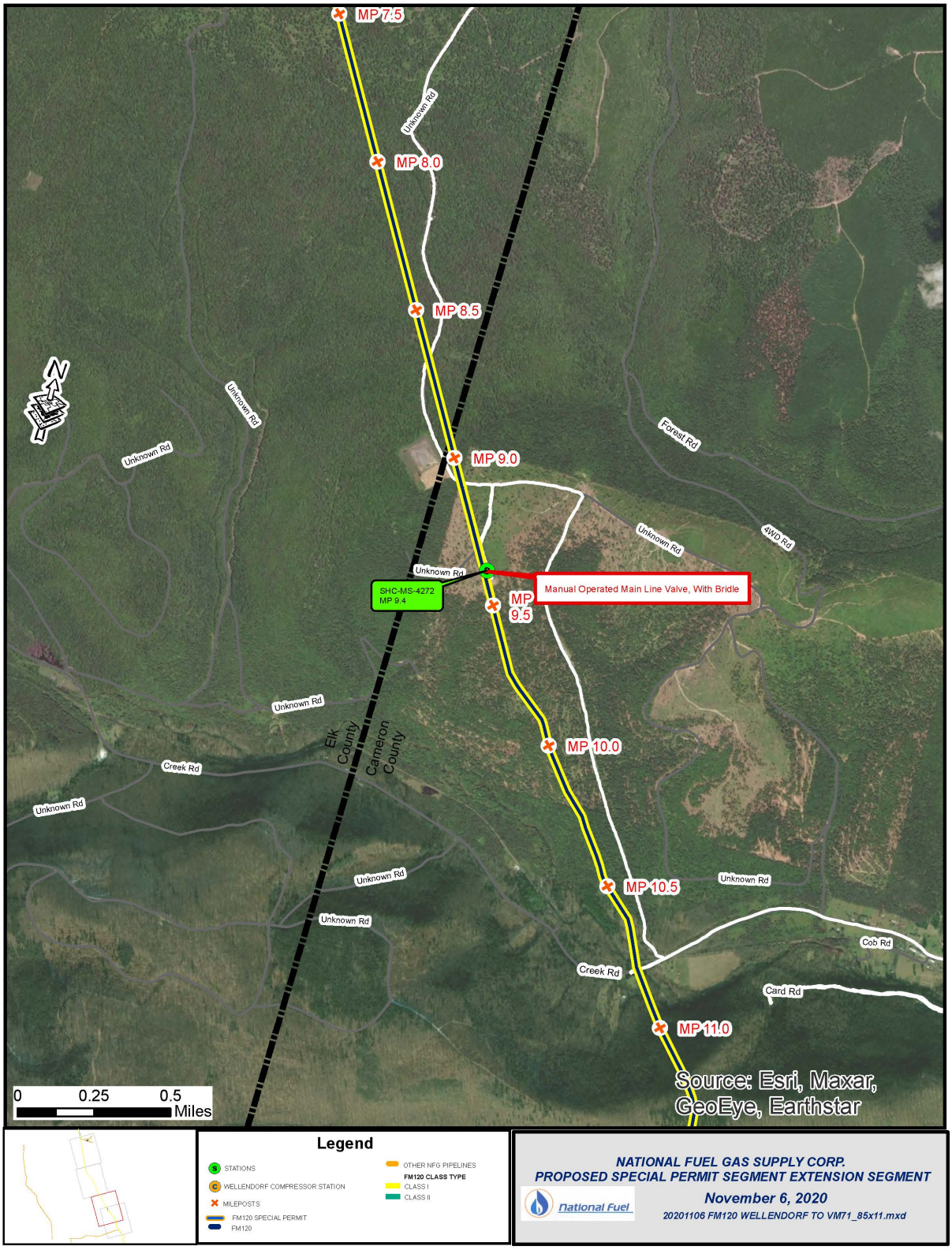
Attachment 1-A – FM120 Pipeline - Special Permit Segment Map



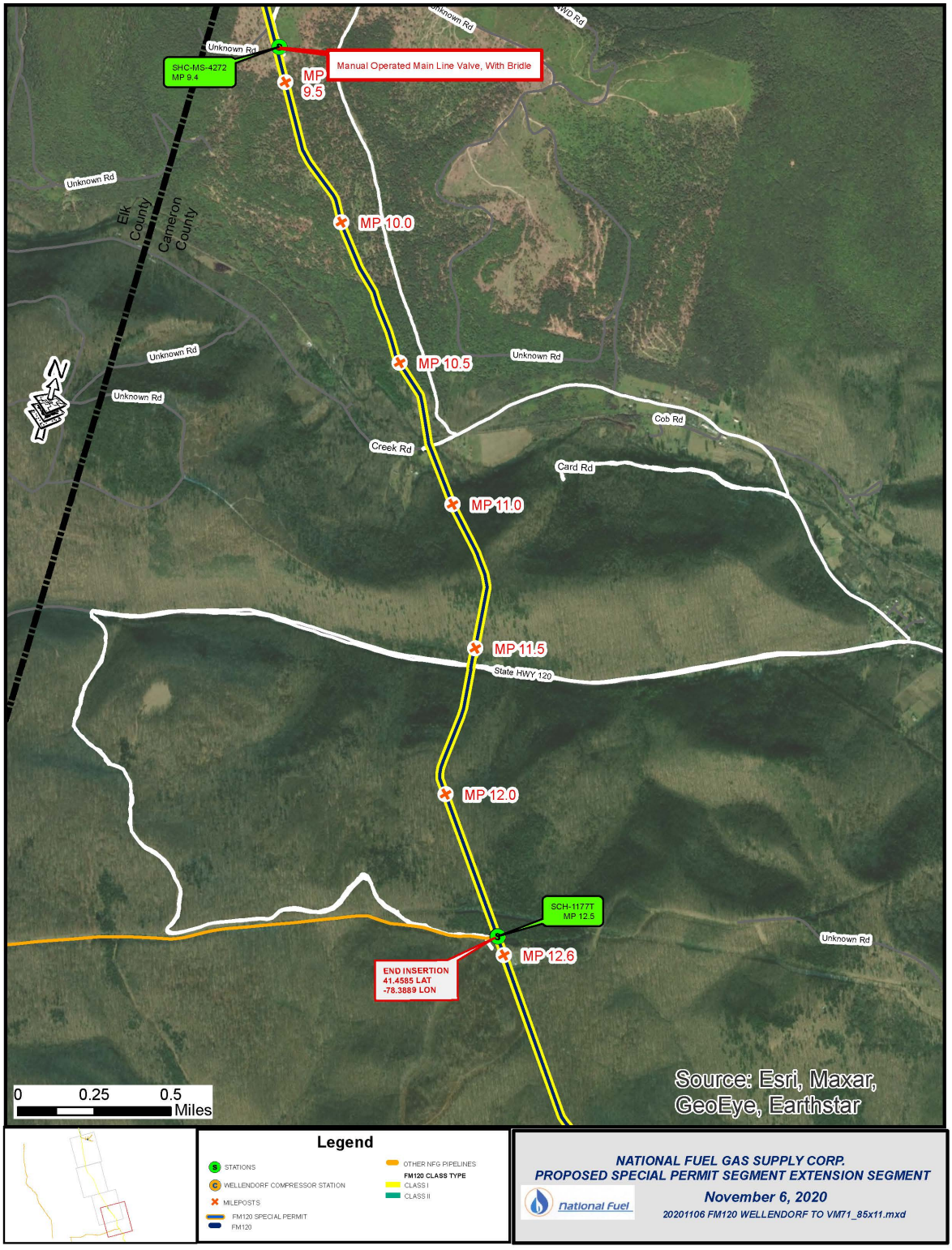
Attachment 1-B – FM120 Pipeline - Special Permit Segment Map



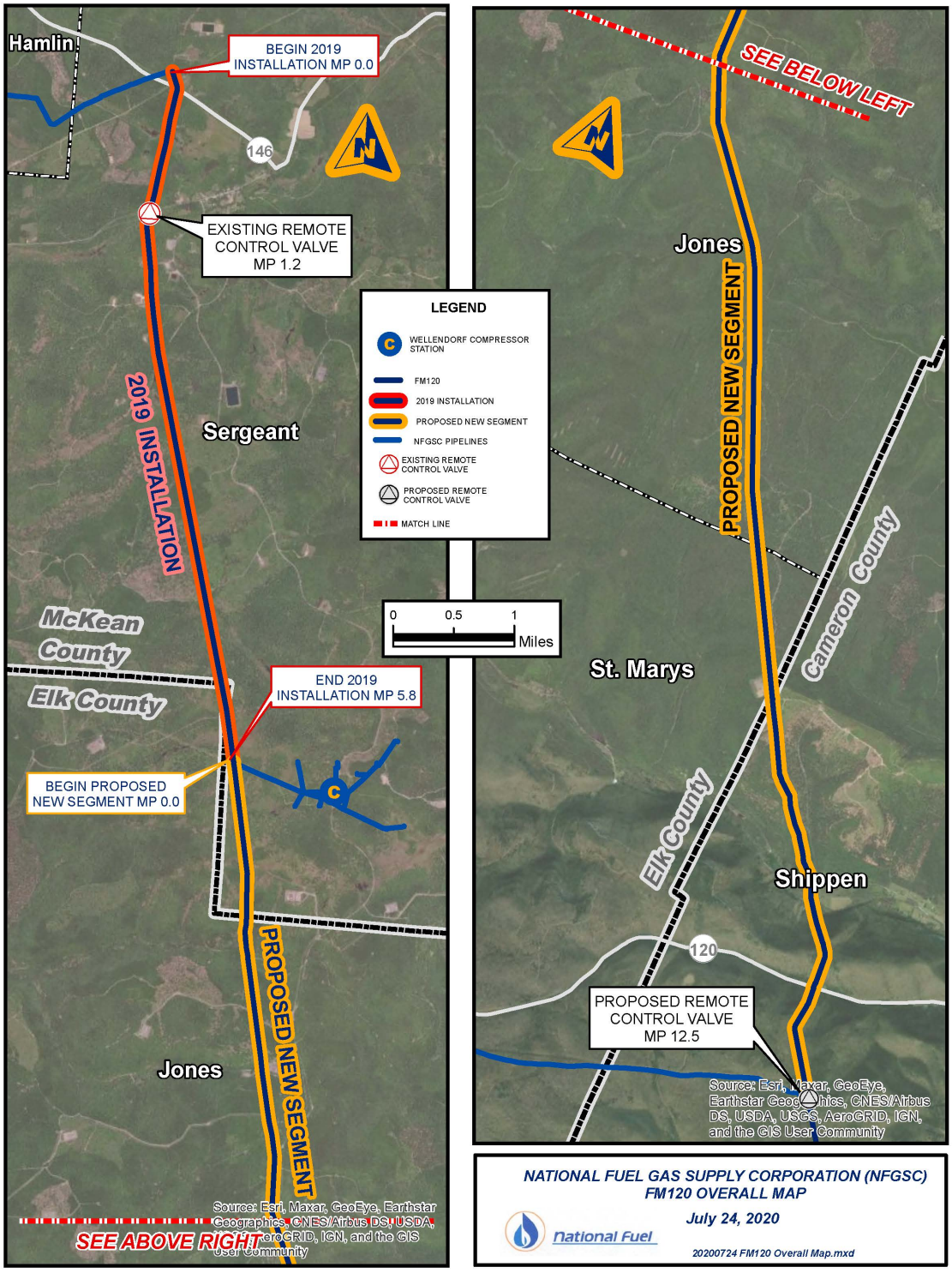
Attachment 1-C – FM120 Pipeline - Special Permit Segment Map



Attachment 1-D – FM120 Pipeline - Special Permit Segment Map



Attachment 2 – FM120 Pipeline Overall Map



Last Page of the Special Permit