ALASKA
PipelineProject

Draft Resource Report 11 – Rev 0
Safety and Reliability

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TransCanada ExxonMobil

DRAFT

Notes:

Yellow highlighting is used throughout this draft Resource Report to highlight selected information that is pending or subject to change in the final report.

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DRAFT

ACRONYMS AND ABBREVIATIONS

§	Section
ADOTPF	Alaska Department of Transportation and Public Facilities
ANGPA	Alaska Natural Gas Pipeline Act of 2004
API	American Petroleum Institute
APP	Alaska Pipeline Project
C.F.R.	Code of Federal Regulations
CPCN	Certificate of Public Convenience and Necessity
CPS	corrosion protection system
DOT	U.S. Department of Transportation
EOC	Emergency Operations Center
ESD	emergency shutdown
FERC	Federal Energy Regulatory Commission
GTP	Gas Treatment Plant
HCA	high-consequence area
ICS	Incident Command System
IMP	Integrity Management Program
MAOP	maximum allowable operating pressure
MLBV	mainline block valve
MP	milepost
NFPA	National Fire Protection Association
NGA	Natural Gas Act
OPS	U.S. Department of Transportation, Pipeline and Hazardous Material Safety Administration, Office of Pipeline Safety
PHMSA	U.S. Department of Transportation, Pipeline and Hazardous Material Safety Administration
PBU	Prudhoe Bay Unit
pt.	Part
PT Pipeline	Point Thomson Gas Transmission Pipeline
PTU	Point Thomson Unit
SCADA	Supervisory Control and Data Acquisition
TAPS	Trans-Alaska Pipeline System
TSA	Transportation Security Administration

11.0 RESOURCE REPORT 11 – RELIABILITY AND SAFETY

The location information, facility descriptions, resource data, construction methods, and mitigation measures presented in this report are preliminary and subject to change. APP is conducting engineering studies, environmental resource surveys, agency consultations, and stakeholder outreach efforts to further refine and define the details of the Project.

The Project described in this resource report is being designed and developed based on estimated volumes of natural gas from projected shipper commitments. If final shipper commitments are significantly different from those estimated, the Project may be adjusted accordingly.

11.1 INTRODUCTION

TransCanada Alaska Company, LLC and Foothills Pipe Lines Ltd., working with ExxonMobil Alaska Midstream Gas Investments LLC, are developing a joint project to treat, transport, and deliver natural gas from the Alaska North Slope (ANS) to pipeline facilities in Alberta, Canada for markets in the contiguous United States and North America. This joint project is referred to as the Alaska Pipeline Project (APP or Project)[1].

As required by Title 18 Code of Federal Regulations (C.F.R.) Section (§) 380.12 and consistent with the Alaska Natural Gas Pipeline Act of 2004 (ANGPA), APP has prepared this draft resource report in support of its application to the U.S. Federal Energy Regulatory Commission (FERC) for a Certificate of Public Convenience and Necessity (CPCN) under Section 7(c) of the Natural Gas Act (NGA) to construct, own, and operate the portion of the Project in Alaska. This draft resource report pertains only to that portion of the Project in Alaska, and unless the context otherwise requires, references in this draft resource report to APP refer only to the Alaska portion of the Project[2].

As shown in Figure 1.1-1 of Resource Report 1, APP will comprise the following major components[3,4]:

- The Point Thomson Gas Transmission Pipeline (PT Pipeline)[5], consisting of approximately 58.4 miles of buried 32-inch-diameter pipeline from the Point Thomson Unit (PTU) to an APP Gas Treatment Plant (GTP) and associated facilities near Prudhoe Bay;

1 Depending on the context, the term APP refers to the joint project or, collectively, to the sponsoring entities.

2 The Canadian Section refers to the portion of the Project from the Yukon border to the pipeline facilities in Alberta, Canada.

3 In previous FERC filings, the Point Thomson Gas Transmission Pipeline was referred to as Zone 1, the Gas Treatment Plant was referred to as Zone 2, and the Alaska Mainline was referred to as Zone 3 of the Alaska-Canada Pipeline.

4 As part of the Project, APP proposes to construct compressor stations, meter stations, various mainline block valves, pig launcher and receiver facilities, as well as associated ancillary and auxiliary infrastructure, including additional temporary workspace, access roads, helipads, construction camps, pipe storage areas, contractor yards, borrow sites, and dock modifications at Prudhoe Bay.

5 The origin of the PT Pipeline is assumed to be located at an outlet from the PTU. The final length may vary depending on the final gas development plan for the PTU.

- The GTP, which will have the capacity to process gas received from the PTU and the existing Central Gas Facility (CGF) on the Prudhoe Bay Unit (PBU) in order to deliver an annual average capacity up to 4.5 billion standard cubic feet per day (bscfd) (standard conditions: 14.73 pounds per square inch absolute and 60º Fahrenheit) of sales quality gas; and
- The Alaska Mainline, consisting of approximately 745.1 miles of 48-inch-diameter pipeline, all of which is buried except as otherwise described in this Resource Report. The Alaska Mainline extends from the GTP to the Alaska-Yukon border east of Tok, Alaska, and includes provisions for intermediate gas delivery points within Alaska.

Table 11.1-1 lists the FERC's filing requirements and additional information applicable to Resource Report 11 taken from FERC's Guidance Manual for Environmental Report Preparation:

TABLE 11.1-1

Alaska Pipeline Project
Resource Report 11 Filing Requirements Checklist

Requirement	Where Found in Document
FERC (FERC) REQUIREMENTS FROM 18 CODE OF FEDERAL REGULATIONS SECTION (§) 380.12	
1. Describe how the project facilities would be designed, constructed, operated, and maintained to minimize potential hazard to the public from the failure of project components as a result of accidents or natural catastrophes. (§ 380.12 [m])	Sections 11.2, 11.3, 11.4, 11.5, 11.6, 11.7, 11.8
OTHER INFORMATION OFTEN MISSING AND RESULTING IN DATA REQUESTS PER FERC'S GUIDANCE MANUAL FOR ENVIRONMENTAL REPORT PREPARATION	
Not applicable (N/A)	N/A

Mileposts (MPs) are commonly used markers along linear projects, such as APP. Where necessary to distinguish the PT Pipeline from the Alaska Mainline, APP has prefixed its MP identifier with a PT Pipeline MP (PMP) or an Alaska Mainline MP (AMP). This convention is used in APP's application and supporting maps and alignment sheets (refer to Appendix 1O of Resource Report 1) to identify resources and features along the respective pipeline routes.

The purpose of Resource Report 11 is to describe how APP's facilities will be designed, constructed, operated, and maintained to reduce potential hazards to the public and the environment from failure of Project components as a result of an accident or natural catastrophe.

11.2 HISTORICAL PIPELINE SAFETY STATISTICS

The transportation of natural gas by pipeline is the safest mode for gas transportation. Pipelines and related facilities are designed and maintained in strict accordance with U.S. Department of Transportation (DOT) standards to ensure both public safety and pipeline reliability and to minimize the opportunity for system failures.

Since 1970, the DOT has maintained statistics on pipeline safety, including incident data. Table 11.2-1 summarizes pipeline safety incidents from U.S. natural gas transmission and natural gas gathering pipelines from 1991 to 2010.

TABLE 11.2-1

Alaska Pipeline Project
Office of Pipeline Safety Incident Summary (by Cause) from 1991 through 2010
(U.S. Gas Transmission and Natural Gas Gathering Pipelines)

Year	Number of Incidents	Construction/ Material Failure/ Operation	Corrosion	Damage by External Forces	Other	Fatalities/ Injuries
1991	29	2	7	14	6	0/11
1992	42	5	6	17	14	3/14
1993	50	9	10	12	19	1/16
1994	45	4	16	16	9	0/22
1995	32	7	2	14	9	2/7
1996	43	6	8	20	9	1/5
1997	33	3	9	15	6	1/5
1998	51	11	13	15	12	1/11
1999	38	6	8	14	10	2/8
2000	54	3	21	14	16	15/16
2001	50	8	10	18	14	2/5
2002	56	20	15	16	5	1/4
2003	70	26	15	20	9	1/8
2004	62	18	15	25	4	0/2
2005	111	26	14	62	9	0/5
2006	78	30	14	18	16	3/3
2007	75	16	29	17	13	2/7
2008	73	17	12	37	7	0/5
2009	73	23	12	23	15	0/11
2010	73	18	24	13	18	10/61
Totals	1,138	258 (23%)	260 (23%)	400 (35%)	220 (19%)	45/226

Source: DOT 2011a.

From 1991 to 2010, the highest percentage of pipeline incidents was caused by damage from external forces (35 percent). External forces include third-party damage from construction equipment, earth movements (e.g., landslides), weather damage, or purposeful damage (e.g., deliberate damage to the pipeline). Corrosion caused 23 percent of pipeline incidents. Generally, older pipelines have a higher incident rate because corrosion is a time-dependent process. There is less corrosion potential for newer pipelines because of more advanced coatings and cathodic protection. Incorrect operations and materials, welding, and equipment failure also accounted for 23 percent of pipeline incidents. Such events are generally localized and largely dependent on pipeline age.

11.3 APP SAFETY REGULATIONS

APP will be designed, constructed, operated, and maintained in accordance with applicable federal, state, and local laws and regulations. APP will operate in a manner that protects the safety of workers, others involved in its operations, customers, and the public. APP is committed to preventing all incidents, injuries, and occupational illnesses. APP will continue to undertake efforts to identify and eliminate or manage safety, security, and health risks associated with Project activities.

APP will meet all applicable federal Occupational Safety and Health Administration regulations (29 C.F.R. Part [pt.] 1910) and all applicable state regulations associated with the Alaska Occupational Safety and Health Alaska Statute (Title 18 Chapter 60) for the design, installation, construction, operation, and maintenance of the Project facilities.

11.4.1 PIPELINE FACILITIES AND PIPELINE ABOVEGROUND FACILITIES

The DOT is responsible for regulating and enforcing pipeline safety in Alaska. The Pipeline Facilities[6] will be designed, constructed, operated, and maintained in accordance with standards that meet or exceed the DOT Minimum Federal Safety Standards, including class location requirements, contained in 49 C.F.R. pt. 192. Pipeline design classification standards, based on population density in the vicinity of an existing or proposed pipeline system, are defined in 49 C.F.R. pt. 192. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. Based on review of aerial photography, both the Alaska Mainline and the PT Pipeline will be constructed entirely within a Class 1 location. Class 1 is defined as a location with 10 or fewer buildings intended for human occupancy. No Class 2, 3, or 4 locations are expected to be crossed by the Pipeline Facilities. Prior to construction, APP will reassess the Pipeline Facilities for current or future changes in class locations.

Section 1.3 of Resource Report 1 describes the material selection and minimum design requirements for the Pipeline Facilities in Class 1 locations. Roadway and highway crossings will also be designed to meet the applicable federal, state, and local agency permit requirements. Furthermore, construction activities as described in Resource Report 1 will be performed in accordance with the Pipeline Facility class locations.

The Pipeline and Hazardous Materials Safety Administration (PHMSA), at its discretion, may grant a special permit to allow an operator alternative compliance with one or more federal safety regulations in circumstances where: it is not inconsistent with public safety; the applicant believes the applicability of that regulation or standard is unnecessary or inappropriate; and sufficient alternative safeguards to public safety are implemented (refer to 49 C.F.R. 190.341). PHMSA commonly applies additional safety conditions to its special permits to ensure safety, environmental protection, and that the action is in the public interest.

APP will meet applicable regulatory requirements in 49 C.F.R. pt. 192 for design, construction, and operation of the pipeline and associated Aboveground Facilities[7]. APP is preparing an application for a special permit from PHMSA to seek a waiver under 49 C.F.R. 190.341 as pt. 192 regulations do not provide specific criteria or guidance for pipeline design and operations in permafrost terrain. The application describes the strain-based design methodology that would allow APP to consider displacement-controlled load effects to establish suitable monitoring and

[6] The Pipeline Facilities will consist of the PT Pipeline and the Alaska Mainline, as discussed in Section 1.3.1 of Resource Report 1.

[7] Aboveground Facilities include the GTP, eight compressor stations, three custody meter stations, various mainline block valves (MLBV), pig launchers, pig receivers, provisions for intermediate gas delivery points, and cathodic protection facilities as discussed in Section 1.3.2 of Resource Report 1.

intervention limits for maintaining pipeline integrity with respect to pipe displacements such as those caused by frost heave.

APP may also apply for a separate special permit from PHMSA to establish alignment with and gain permission for utilizing multi-layer coating systems to demonstrate compliance with 49 C.F.R. pt. 192.

APP will also design, construct, operate, and maintain the pipeline Aboveground Facilities to comply with applicable requirements of 49 C.F.R. pt. 192. The compressor stations will be equipped with gas detection and fire protection equipment. An emergency shutdown (ESD) system will be designed to shut down and isolate each compressor station under predetermined conditions. APP will have an overpressure protection system such as relief valves, control valves, and/or isolation valves to protect the Pipeline Facilities. In addition, the compressor station equipment will be designed to shut down automatically if a mechanical failure poses risks to the equipment or otherwise constitutes a hazard.

Mainline block valve (MLBVs) will be equipped with pressure-sensing devices that will automatically close a valve if the gas pressure in the pipeline drops below a pre-established value.

Table 1.3.2-1 of Resource Report 1 and Appendix 1A of Resource Report 1 identify the pipeline Aboveground Facilities.

11.4.2 GAS TREATMENT PLANT

[Note: APP will provide safety and reliability engineering information related to the GTP consistent with the FERC guidance. This information will be included as Appendix 11B "GTP Engineering Information" in the final report.]

The GTP will be equipped with a full range of automatic emergency detection and shutdown systems. A fire and gas detection and alarm system will be designed in accordance with National Fire Protection Association (NFPA) 72. Multiple gas detectors will monitor for flammable and toxic gases. Fire detectors will cover areas with fired equipment and large rotating equipment. Audio and visual alarms (e.g., bells, horns, warning lights) will be provided throughout the modules, so that personnel are made aware of emergencies. All gas and fire detectors and alarms will be connected to a local fire and gas panel (located in that particular module) or to the facility Safety Instrumented System. Each panel will provide the system with visual annunciation, circuit supervision, automatic control of ventilation systems, and automatic control for fire suppressant discharge into enclosed modules (for those modules equipped with fire suppression). These systems would interface with an ESD system for the GTP. The ESD system will be designed to isolate, shut down, and de-pressure the appropriate GTP element upon mechanical malfunction or process upset. These safety and emergency systems will be tested routinely to ensure performance.

The GTP will be equipped with relief valves to protect the piping from over-pressurization should the compressor control system malfunction. Standard fixed and portable fire protection, first aid, and safety equipment will be maintained at the GTP and plant personnel will be trained in proper equipment use and in first aid.

11.4 APP OPERATION AND MAINTENANCE

11.4.3 PIPELINE AND ASSOCIATED ABOVEGROUND FACILITIES OPERATION AND MAINTENANCE PLAN

To promote pipeline safety, regulations contained in Subparts L and M of 49 C.F.R. pt. 192 require pipeline operators to establish public awareness and damage prevention programs, an emergency response plan, and security practices; to maintain specific operating pressures; and to perform regular pipeline patrols, leak surveys, and other surveillance activities. The DOT requires the operator to prepare an Operation and Maintenance Plan in accordance with the requirements in 49 C.F.R. 192.605 before placing a natural gas pipeline into service. APP will prepare and implement an Operation and Maintenance Plan that includes the following activities and operating procedures*:*

- Worker qualification to operate and maintain the pipeline system in accordance with the 49 C.F.R. pt. 192 Operator Qualification Rule;
- Periodic contact of property owners, utilities, local government agencies, contractors, and other interested parties to inform them of the pipeline location and procedures to be followed in reporting and responding to a pipeline system emergency;
- An Integrated Public Education and Awareness Program, which includes education of contractors and the local public in damage prevention;
- Patrols of the right-of-way to check for signs of leakage, damage, erosion, pipeline marker, and unauthorized encroachments;
- Pipeline markers identifying APP as the operator will display telephone numbers for emergencies or general inquiries;
- Participation in Alaska's "One Call" system (Digline), including staking and marking service for third-party construction and landowner requests;
- Planned inspections of field locations to ensure conformance with existing operating and maintenance standards and safe work procedures;
- Periodic surveys and inspections to monitor and adjust performance of the cathodic protection system;
- Training programs for operation and maintenance personnel to maintain competency in safety procedures and emergency preparedness;
- Standard procedures for protecting assets and ensuring public safety during planned maintenance and corrective maintenance activities; and
- Periodic testing and inspection of pressure-limiting devices and ESD systems at the compressor stations.

These procedures and programs will promote heightened safety behavior by pipeline system personnel, maintain the integrity of the pipeline, and reduce the potential for pipeline incidents.

APP will operate the Alaska Mainline and the PT Pipeline from a central Gas Control Center with the capability to monitor and control the Pipeline Facilities, including pipeline Aboveground Facilities (remotely start and stop compressor units; change control set points as required for pipeline operation; and monitor for alarm conditions). Aboveground Facilities can also be operated locally as needed. The Gas Control Center will be staffed 24 hours a day, year-round. A second, fully functional Backup Control Center will be available in the event the primary Gas Control Center becomes unavailable for any reason. Both control centers would have redundant communication to monitor pipeline status.

APP's continuous monitoring and operation of the pipeline system will be accomplished principally through a Supervisory Control and Data Acquisition (SCADA) system, which is a computer system for gathering and analyzing data from real-time systems and operating remote facilities. The SCADA system will gather information from locations along the pipelines, such as meter stations and compressor stations, transmit the information back to the Gas Control Center, compare collected data to pre-set safe operating data points, and organize and display the data including alarm displays for actual operating points that do not meet pre-set operating criteria.

During the course of normal operations, planned maintenance activities at meter stations and compressor stations will include routine checks, calibration of equipment and instrumentation, inspection of critical components, and servicing and overhauls of equipment. Equipment health will be monitored for critical rotating equipment to enable troubleshooting, optimization, and predictive maintenance planning. Unplanned maintenance activities include investigation of problems identified by the Gas Control Center and station monitoring systems, and implementation of corrective actions. Pipeline's procedures and programs, to be developed, will address job responsibilities, staffing, organization, and schedules.

A corrosion protection system (CPS) will be installed to mitigate external corrosion of the buried portion of the pipeline. 49 C.F.R. pt. 192 Subpart I requires the CPS, together with the external coating to provide protection against time-dependent pipeline integrity issues, specifically external corrosion and stress corrosion cracking. APP's CPS would be designed to ground naturally occurring electrical currents (telluric currents) caused by variations in the earth's geo-magnetic field in northern regions. Due to variations in soil resistivity properties and telluric current effects, APP's CPS will include provisions for adjustments to accommodate actual soil properties and telluric current effects encountered while in service. Early installation and activation of the ground bed anode system would address cathodic protection considerations during the pipeline's "dormant period" (i.e., when the pipe segment has been constructed but is not yet transporting gas). Internal corrosion is not expected to be a factor because the natural gas stream is clean and dry. The CPS would be active within six months of operation start-up as required by DOT standards. APP will conduct periodic cathodic protection surveys to monitor status of the CPS and will adjust systems as required to maintain the integrity of the pipeline. APP would monitor the condition of the pipe, external coating, and the effectiveness of the CPS, as required by DOT. APP will maintain and repair the pipe, the pipe coating, and the CPS as appropriate, and would record and report such activities to applicable authorities, as required by regulations.

Pipelines will be designed in accordance with the latest applicable seismic practices, based on the region's potential for earthquake activity. Geologic hazards, including earthquakes, are discussed in Resource Report 6.

A regional operations and maintenance office in Alaska will maintain the pipeline and Aboveground Facilities. APP intends to conduct periodic right-of-way maintenance and brush control along the pipeline route within the permanent right-of-way as specified in APP's Erosion

Control, Revegetation, and Maintenance Plan (refer to Appendix 1J of Resource Report 1) and APP's Wetland and Waterbody Construction and Mitigation Procedures (refer to Appendix 1K of Resource Report 1) to ensure that cathodic protection surveys, Integrity Management Plan in-line inspection runs, visual inspection (e.g., aerial or ground patrols), and facilities maintenance can be effectively performed.

Pipeline integrity regulations contained in Subpart O of 49 C.F.R. pt. 192 require operators to develop and follow a written Integrity Management Program (IMP) containing prescribed program elements that address the risk for each segment of a gas transmission pipeline located in a high-consequence area (HCA). A covered segment is defined in 49 C.F.R. pt. 192 as a segment of gas transmission pipeline located in a high consequence area.

To implement the IMP for pipeline segments in identified HCAs, APP will first develop a written Integrity Management Plan that includes:

- Identification of all covered segments;
- A Baseline Assessment Plan to assure the integrity of all covered segments;
- A framework that contains all required elements of the IMP;
- A process to assure continual improvement to the program;
- Provisions to implement industry standards invoked by reference; and
- A process to document (and notify the PHMSA Office of Pipeline Safety [OPS] as required) any changes to its program.

The framework developed in the Pipeline Integrity Management Plan will evolve and develop into a more detailed and comprehensive IMP as information is gained and incorporated into the program. The framework and subsequent IMP will include all of the following program elements:

- Identification of all HCAs;
- Baseline Assessment Plan;
- Identification of threats to each covered segment, including by the use of data integration and risk assessment;
- A direct assessment plan, if applicable;
- Provisions for remediating conditions found during integrity assessments;
- A process for continual evaluation and assessment;
- A confirmatory direct assessment plan, if applicable;
- A process to identify and implement additional preventive and mitigative measures;
- A performance plan including the use of specific performance measures;
- Recordkeeping provisions;
- Management of change process;
- Quality assurance process;

- Communication plan;
- Procedures for providing to regulatory agencies copies of the risk analysis or IMP;
- Procedures to ensure that integrity assessments are conducted to minimize environmental and safety risks; and
- A process to identify and assess newly identified HCAs.

49 C.F.R. 192.903 determines HCAs to be identified using two methods. APP evaluated the Alaska Mainline and the PT Pipeline using the second method, where an HCA includes any area within a potential impact circle that contains 20 or more buildings for human occupancy or an identified site. Based on preliminary review and using Method 2, APP identified 21 HCAs that will be crossed by the Alaska Mainline and 3 HCAs that will be crossed by the PT Pipeline. These HCAs are presented in Table 11.4.1-1.

TABLE 11.4.1-1

Alaska Pipeline Project
High-Consequence Areas

High-Consequence Area (HCA) Description	Milepost Begin	Milepost End	Length of HCA (miles)
POINT THOMSON GAS TRANSMISSION PIPELINE			
ExxonMobil gravel work pad (future Point Thomson Plant)	-0.1 [a]	0.2	0.3
Gas Treatment Plant	58.1	58.4	0.3
		Subtotal	0.6
ALASKA MAINLINE			
Gas Treatment Plant	0.3	1.3 [a]	1.7
Trans-Alaska Pipeline System (TAPS) Pump Station	62.1	63.5	1.5
ADOTPF Chandalar Maintenance Facility	177.1	178.4	1.3
Marion Creek Campground and BLM Facility	238.7	240.4	1.8
Coldfoot Hotel and Restaurant	244.1	245.0	1.0
Hot Spot Restaurant	355.1	356.6	1.4
Yukon River Lookout and Rest Area	359.1	360.4	1.3
TAPS Pump Station	361.3	362.7	1.4
Livengood Camp	403.9	404.9	1.1
TAPS Pump Station	420.7	421.8	1.2
Welding Shop	454.9	456.4	1.5
Firing Range of the Eielson Air Force Base	485.2	486.7	1.5
TAPS Pump Station	494.9	496.3	1.4
Community Center and School	548.0	548.9	1.0
Delta Meat and Sausage Company	554.9	555.9	1.0
Sawmill Creek and Motel	564.0	565.5	1.5
Dot Lake Camp, Community, and Church	606.5	608.2	1.8
Island Lake	735.8	737.0	1.2
Border City Motel, Lodge and RV Park, Gas Station	738.1	740.1	2.0
Alaska-Canada Border Crossing	742.2	743.5	1.3
		Subtotal	27.8
		Project Total	**28.4**

Note: The totals shown in this table may not equal the sum of addends due to rounding.

[a] "Negative" MPs do not represent areas along the pipeline route, but areas near the beginning of the pipeline route that fall within a potential impact circle.

The IMP for pipeline segments operating at an alternative maximum allowable operating pressure (MAOP) will include the integrity requirements of 49 C.F.R. 192.620 Subpart L which list additional integrity management activities that an operator is required to do to operate at an alternative MAOP. The additional integrity management provisions of 49 C.F.R.192.620 apply to all pipeline segments operating in accordance with the alternative MAOP rule requirements. The IMP will specifically address the additional requirements from 49 C.F.R. 192.620 for baseline assessments, threat identification, and integrity assessments.

In accordance with the IMP, APP will periodically assess the integrity of covered segments, and pipeline segments operating at the alternative MAOP using the assessment methodologies acceptable to the industry and PHMSA. These segments would be periodically inspected using high-resolution in-line magnetic flux tools.

In-line inspection tools can be used for assessments of a number of threats, including metal loss from corrosion. In-line inspection tools can also be used to inspect for deformation caused by slope movements, fault displacements, frost heave, thaw settlement, or other mechanisms. Conditions discovered during assessments that exceed APP's acceptance criteria would be assessed and remediated to ensure the condition is unlikely to pose a threat to the integrity of the pipeline.

The written IMP and records that demonstrate compliance with 49 C.F.R. pt. 192 Subpart O will be maintained for the life of the pipeline and be available for review by OPS and/or state regulators during inspections.

11.4.4 GTP OPERATION AND MAINTENANCE PLAN

The GTP design, installation, construction, inspection, operation, and maintenance would be managed internally through a system for operations integrity management that will address safety, security, and health risk.

The GTP would be monitored and controlled from a Central Control Center located in the Operations Center on the GTP site. APP will prepare and implement an Operation and Maintenance Plan to comply with relevant regulations that includes the following activities and operating procedures:

- Worker qualification to operate and maintain the GTP systems;
- Measures to monitor conformance with existing operating and maintenance standards and safe work procedures;
- Training programs for operation and maintenance personnel to maintain skill levels, review safety procedures, and emergency preparedness;
- Standard procedures for protecting assets and ensuring public safety during planned maintenance and corrective maintenance activities; and
- Periodic testing and inspection of pressure-limiting devices and ESD systems.

These procedures and programs would increase safety, maintain the integrity of the GTP, and reduce the potential for incidents.

Planned maintenance activities at the GTP will include routine checks, calibration of equipment and instrumentation, inspection of critical components, and servicing and overhauls of equipment. An equipment health monitoring system will be installed to collect and trend data, monitor critical rotating equipment, and manage data so that it can be accessed both locally and remotely to enable troubleshooting, optimization, and predictive maintenance planning. Unplanned maintenance activities include investigation of problems identified by the monitoring system, and implementation of associated corrective actions. GTP's procedures and programs, to be developed, will address job responsibilities, staffing, organization, and schedules. Planned maintenance shut downs (turnarounds) will be scheduled and coordinated to meet the maintenance required for major equipment.

In order to facilitate safe operation and maintenance and in accordance with American Petroleum Institute (API), NFPA, and APP standards, safety equipment will be included in the design of the GTP. Fire and gas detection and alarm systems will be installed throughout the facility and emergency de-pressuring and/or shutdown systems would be designed to be initiated automatically or remotely. The design of the GTP will also include a fire water system, pressure relief valves, blow-down valves, and ESD systems. The GTP operations and maintenance personnel will be trained in effective communication methods to respond to various unplanned events.

APP will also develop an Initial Integrity Management Plan for the GTP which will include the following:

- Identification of all high-risk equipment and process piping;
- A baseline assessment to ensure the integrity of all high risk equipment and process piping;
- A framework that contains all required elements of integrity management;
- A process to ensure continual improvement;
- Provisions to implement industry standards invoked by reference; and
- A process to document any changes.

The initial plan would evolve into a detailed and comprehensive GTP Integrity Management Plan as information is obtained and developed. This plan would include all of the following program elements:

- Identification of all high risk equipment and process piping;
- Baseline assessment plan;
- Identification of threats to high risk equipment and piping, including by the use of data integration and risk assessment;
- A direct assessment plan, if applicable;
- Provisions for remediating conditions found during integrity assessments;
- A process for continual evaluation and assessment;
- A confirmatory direct assessment plan, if applicable;
- A process to identify and implement additional preventive and mitigation measures;
- A performance plan including the use of specific performance measures;

- Recordkeeping provisions;
- Management of change process;
- Quality assurance process;
- Communication plan;
- Procedures for providing copies of the risk analysis or GTP Integrity Management Plan to appropriate parties; and
- Procedures to ensure that integrity assessments are conducted to minimize reliability and safety risks.

A combination of online condition monitoring, and offline inspections (during scheduled facility turnarounds) would be used for the baseline and continuous monitoring program. Specific methods would be determined as the design progresses and the specific equipment is selected, but would follow appropriate industry practice.

The GTP Integrity Management Plan and records demonstrating compliance would be maintained for the life of the facility and would be available for review during inspections.

11.4.5 APP EMERGENCY RESPONSE PLAN

APP system emergencies can include natural gas leaks, fire or explosion, and/or damage to the Pipeline Facilities, Aboveground Facilities, or Associated Infrastructure[8] caused by internal factors (e.g., equipment malfunction) or external factors (e.g., mechanical damage, geologic events). For APP pipelines, 49 C.F.R. 192.615 requires that pipeline operators prepare and follow a written emergency response plan that includes procedures to identify the hazards and mitigate the risks associated with a natural gas pipeline emergency.

Prior to operations, APP will develop an Emergency Management System to provide an effective and comprehensive response to emergency events*.* The Emergency Management System would use the Incident Command System (ICS) structure to coordinate incident response that would meet all regulatory requirements and applicable laws. Prior to operation, APP will develop a program that would describe and document plans to coordinate with federal, state, and local emergency agencies that may be affected by APP's operations.

Local operating facilities will each have a site-specific Emergency Preparedness and Response Plan. These plans would identify the types of emergencies that would require notification to appropriate agencies and detail the response organization and resources (diagrams, maps, plans, and procedures) necessary to adequately respond.

Operations personnel would use the ICS to coordinate with local emergency response agencies to ensure appropriate communications, understanding, and cooperation are in place. This would ensure that Emergency Preparedness and Response Plans are appropriately linked to plans maintained by other affected response agencies or third parties, such as Alyeska Pipeline Service Company.

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8 Associated Infrastructure and land required to construct and operate APP include additional temporary workspace (ATWS), access roads, helipads, airstrips, construction camps, pipe storage areas, contractor yards, borrow sites, and dock modifications, as discussed in Section 1.3.3 of Resource Report 1.

APP's local Emergency Preparedness and Response Plans will be supported by various Emergency Operations Centers (EOCs). There would also be a backup EOC in the event that the primary EOC is not operational. The purpose of the EOCs is to provide coordinated support for field personnel and other emergency services following an APP system emergency, and to mobilize Project resources to work with local first responders to secure the incident site and control/contain the emergency event.

In the event of an emergency, APP's operating personnel would take appropriate actions in accordance with the plan to protect lives, reduce injuries and illnesses, protect property and the environment, and maintain customer service. The plans will cover all of the elements of the Project, including the GTP, and would contain the following information:

- Location and contact numbers for each facility;
- Listing of company personnel, contracted response organizations, third parties such as Alyeska Pipeline Service Company, and PBU as well as local emergency response authorities to contact;
- Listing of emergency equipment available at field locations;
- Listing of response equipment contracted through approved response organizations;
- Description of the ICS roles and responsibilities (roles of field supervisors, natural gas control operators, field crews, and support personnel during an emergency), including an APP Incident Management Team that would use the ICS Unified Command structure to contain and control the emergency on site;
- Mutual Aid Agreements and processes for securing additional assistance from non-company resources, if needed; and
- Requirements for documenting emergency events and reporting the emergency to company and regulatory authorities.

The Emergency Preparedness and Response Plans would include procedures for:

- Receiving, identifying, and classifying emergency events, natural gas leakage, fires, explosions, and natural disasters;
- Establishing and maintaining communications with local fire, police, public officials, and third parties such as Alyeska Pipeline Service Company, and PBU in order to coordinate emergency response within the framework established by the ICS;
- Making personnel, equipment, tools, and materials available at the scene of an emergency;
- Protecting people first and then environment and property, and making them safe from actual or potential hazards;
- Isolation, evacuation, and use of ESD systems; and
- Liaison with public authorities and local utilities.

In addition to APP's Emergency Preparedness and Response Plan for construction of the APP system, APP also will develop specific Emergency Preparedness and Response Plans for its construction camps.

An outline of APP's Fire Prevention and Suppression Plan is provided as Appendix 11A. [Note: The Fire Prevention and Suppression Plan will be provided in the final report.] The Fire Prevention and Suppression Plan outlines the responsibilities of Project personnel for prevention and suppression of fires and defines minimum fire prevention and suppression measures used during construction of the Project.

11.4.6 APP INTEGRATED PUBLIC AWARENESS PROGRAM

PHMSA regulations require all pipeline operators to implement a public awareness program that is consistent with the guidelines contained in the API Recommended Practices 1162, Public Awareness Programs for Pipeline Operators.

APP will develop and implement an Integrated Public Education and Awareness Program to educate and inform excavators, contractors, emergency services, the public and public officials, customers, and landowners about APP system safety in accordance with applicable regulations. The program will be designed to raise public awareness of APP's facilities by providing information on hazards associated with APP system operations, pipeline location information, leak detection and response, and damage prevention.

Information would be communicated through newspaper advertisements, open houses, meetings, and Project-specific mailings. APP's efforts to increase public awareness and education about APP operations and safety issues would include the following regular interaction with stakeholders:

- Host information meetings available to the public that include right-of-way information, emergency awareness, emergency response, and reporting information, including the 24-hour emergency number;
- Provide emergency information and training to emergency response officials (e.g., first responders, local emergency planning committees, state emergency response agency);
- Provide right-of-way information to excavators; and
- Ensure availability of pertinent Project information to the public.

11.4.7 APP SECURITY PRACTICES

In December 2010, the Transportation Security Administration (TSA) revised its Pipeline Security Guidelines (TSA 2010). The guidelines provide explicit agency recommendations for pipeline industry security practices.

APP will develop security programs and practices as recommended by TSA and in accordance with GTP's management system for operations integrity. This would include development of a risk-based Project Security Program based on a security vulnerability assessment to address and document APP's policies and procedures for managing security-related threats, incidents, and responses. APP will include actions to reduce service interruptions and restore gas supply as soon as practical while ensuring the safety of the public. APP will develop plans for rapid recovery of gas service after an incident and will integrate these plans into its operating procedures.

The Project Security Program will be customized to the needs of APP's system and would include the following elements:

- System description;
- Security administration and management structure;
- Risk analysis and assessments;
- Physical security and access control measures;
  - Fences at appropriate aboveground facilities
  - Lockable gates
  - Chained and lockable equipment
- Equipment maintenance and testing;
- Personnel screening;
- Communications;
- Personnel training;
- Drills and exercises;
- Security incident procedures;
- Escalating protective measures in face of elevated threats;
- Plan reviews;
- Recordkeeping;
- Cyber asset/SCADA system security measures; and
- Security testing and audits.

11.5 REFERENCES

U.S. Department of Transportation (DOT). 2011a. Significant Pipeline Incidents. Available online at: http://primis.phmsa.dot.gov/comm/reports/safety/SigPSI.html?nocache=9740. Accessed March 2011a.

Transportation Security Administration (TSA). 2010. Pipeline Security Guidelines. Available online at: http://www.tsa.gov/assets/pdf/guidelines_final_dec2010.pdf. Accessed July 2011.