Execution Plan
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2.3 EXECUTION PLAN

2.3.1 Project Execution Plan

1) Introduction

This section describes TransCanada's proposed plan for managing the Project during the Execution Phase.

The current schedule shows the Project commencing upon award of the AGIA License, which for the purposes of this Application is assumed to be April 2008. Based on this start date, it is estimated that the In-Service Date could be as early as November 2017 and full volume flow could be scheduled in early 2018.

2) Management Approach

As in the Development Phase, the PMT would oversee all aspects of the pipeline and facility work in Alaska and Canada. As previously noted, TransCanada does not intend to develop, own and operate the GTP, but would contract with a third party to do so. However, for the purposes of this Application, execution of the GTP is included in this section.

a) Engineering Procurement and Construction Management Contract Strategy

Project management, detailed engineering, procurement and construction management functions would be handled by the EPCM (or EPC) contractors as discussed in Section 2.2.1(2) "Management Approach", under the direction of the PMT. Pre-construction, construction, procurement of minor materials and minor permitting would be performed by the construction contractors.

As discussed in Section 2.2.1(2), it is possible that engineering, procurement and construction could be wrapped separately in single EPC contracts for each of the Alaska and Canada Sections. It is likely that the GTP and the pipeline facilities would be handled under separate contracts.

If an EPC strategy was chosen, construction would be handled by the EPC contractors, either using their own forces or using sub-contractors. With this strategy, the EPC contractors could assume all or a major portion of the construction cost risk. While this contracting strategy is attractive in terms of providing relative cost certainty, it has been TransCanada's experience that recently, due to market conditions, the cost of transferring risk in this way can be substantial. The alternative would be to use an EPCM strategy where engineering, procurement and construction management are handled by an EPCM contractor using one of several forms of cost-reimbursable contract, and the construction contract awarded at a later date, based on bids for lump-sum, schedule-of-rates or cost-reimbursable contracts. The determination of which strategy to use would be made during the Development Phase, after researching the market conditions for such services at that time.

At this point, however it is assumed that the APP in Alaska and Canada would be managed and executed by two separate EPCM contractors, with the understanding that there may be advantages to utilizing the same organization in Canada and Alaska. This option would be reviewed during the Development Phase of the Project, taking into

account the state of the market for such services at that time. Similarly, the term "EPCM contactor" is used with the understanding that the form of contract could be EPC or EPCM. The EPCM contractor organizations would be mobilized during the Development Phase and would be expanded where necessary during the Execution Phase. The EPCM contractors would work under the direction of TransCanada's PMT.

The amount of construction work required for the APP will strain the capabilities of the North American construction market and will likely require contractors to purchase additional construction equipment and certain specialized equipment. As lead times for such equipment have increased substantially in recent years, engaging construction contractors early will be the key to ensuring that construction resources will be available for the Project.

b) Environmental Management Contract Strategy

In order to provide continuity, TransCanada plans to use the same Environmental Management contractors during the Execution Phase that were used in the Development Phase, using a similar cost-reimbursable contract. To carry out the environmental activities identified for the Execution Phase, there may be a need to augment the previously procured environmental consulting services with the services of individuals qualified in pipeline construction inspection. To develop constructible and compliant environmental protection plans, contributions from individuals with biophysical science expertise would be needed, together with input from qualified individuals who have experience in implementing environmental mitigation. Locally qualified individuals would be utilized to the extent practical. Once construction commences, the environmental inspectors would report directly to the on-site construction management organization with technical and policy direction provided by TransCanada's PMT.

c) Owner's Project Organization

The level of Project activity would increase substantially as the Project moves through detailed design and into construction. This would be accompanied by a corresponding increase in the size of the EPCM contractors' workforces. Initially additional staff would be brought on board for detailed design, procurement and logistics. Then, as the Project approaches construction, additional construction planning and construction management staff would be required.

The overall structure of the PMT would remain similar to that of the Development Phase, although additional project management, environmental management and engineering staff would be needed to provide effective oversight of the EPCM and EM contractors as the project moves into detailed design and construction.

The Project Services group within the PMT would increase in numbers as the Project moves through the Execution Phase, peaking during commissioning and start-up. The group would have a strong focus on operability of the finished facilities and would lead the testing and commissioning activities at the end of the phase. Most of the group, with the exception of the temporary commissioning staff, would remain with TransCanada upon Project completion, but be transitioned into the Field Operations organization. TransCanada would design its organization for the Execution Phase during the Development Phase.

3) Governance Model

The Governance Model proposed for the Execution Phase of the Project would, like the model for the Development Phase, be based on TransCanada's management systems, programs and processes. However, as the Project approaches the Execution Phase, Project-specific processes would be developed that align with TransCanada's core policy framework but accommodate the unique characteristics of the Project and the management systems in place with the EPCM contractors.

4) Detailed Engineering Plan

During the Development Phase, the detailed specifications for all major materials and equipment (pipe, compressor and chiller packages, GTP modules, large valves, and other long-lead materials and equipment) would be finalized, material specifications prepared, and bid packages compiled and tendered. Also in the Development Phase, a portion of the detailed design work for the pipeline, facilities and the GTP would be developed to the extent that construction contract bid packages can be prepared and bid prior to the end of the phase.

Detailed engineering would include the following:

- Survey

  Detailed surveys of the pipeline route would be completed. All existing and proposed pipeline and utility crossings and adjacent facilities would be identified and complete centerline elevations recorded in the GIS. Based on this information, alignment sheets would be finalized, incorporating all pertinent engineering, environmental and survey data, and would include all isolation valve locations, as well as compressor station, meter station and O&M facility locations. Similarly, detailed surveys of all facility sites, materials sites and the GTP site would be undertaken prior to commencing work.

- Field testing and field studies

  Any field testing (boreholes, materials-related testing, testing of specialized equipment, etc.) and field studies (environmental, hydrology, pipe stockpile site locations, etc.) not previously required for permitting would be completed and the results would be analyzed for incorporation into the final site-specific designs.

- Input to procurement of materials and equipment

  Engineering input to the procurement of materials and equipment would be provided to ensure compliance with the Project's design criteria and operating philosophy. Vendor submittals for engineered materials and equipment would be submitted to the engineering groups who would verify technical details against the Project design criteria. Such submittals would require engineering approval prior to manufacture or fabrication.

- Land acquisition and minor permitting

  Line lists, drawings and land ownership data would be provided to support the process of acquiring land, easements, road use agreements and third party facility crossing agreements. A plan, profile and book of reference for the Canada Section

would be prepared and submitted to the Northern Pipeline Agency, as described in Section 2.2.4.1(2)(a)(ii).

- Specifications and designs for temporary facilities

  Detailed design and construction drawings and specifications, as well as plans for applicable environmental mitigation measures would be completed for all temporary facilities, incorporating the outcome of the EIS process in Alaska, and the regulatory update process in Canada. Temporary facilities would include materials sites, access roads, work pads, construction camps and any other temporary facilities that are required to support construction of the Pipeline System such as bridges and airstrips.

- Specifications and designs for permanent facilities

  All final specifications and site-specific designs would be completed for construction of the pipeline, compressor stations, meter stations, GTP, O&M facilities and any other permanent works required for operation of the Pipeline System. These designs and specifications would be used for:

  - procurement of all remaining equipment and materials;
  - submittal to the Northern Pipeline Agency as described in Section 2.2.4.1(2)(a)(i);
  - input to applications for all remaining permits for the Project; and
  - "Issued for Construction" drawings for issue to construction contractors.

- Engineering support during construction

  Engineering services would also be provided during construction to clarify and resolve engineering issues that arise, and to review submittals from contractors and vendors, and as-built drawings from construction contractors.

When the final Decision to Proceed is made, all pipe, equipment and material purchase orders would be triggered, beginning with the items with the longest delivery lead-times. Pipe stockpile sites would be prepared and pipe stockpiled at these sites as it comes available. The pipe mills would be responsible for pipe transportation and stockpiling, providing the pipe FOB to the stockpile sites.

5) Professional Practice

As is the case in the Project Development Phase, all engineering work during the Project Execution Phase would be in accordance with TransCanada's *Practice of Engineering* standard. During the Development Phase, as plans for detailed design are prepared, Project-specific detailed standards and procedures would be developed to guide the detailed design process. These standards and procedures would meet or exceed TransCanada's requirements while taking into account the unique nature of the Project.

6) Construction Plan

The current plan for construction is outlined below. The plan would be further refined during the Development Phase. All final plans would be based on updated engineering designs, infrastructure and logistics information, and be compliant with regulatory directions.

a) Construction Contract Strategy

The approach would be to award, to the greatest extent possible, lump-sum contracts for construction work, however market conditions may favor alternative forms of contracting, such as EPC or cost reimbursable contracts with target prices. The major construction contracts would be multi-season construction packages and would be issued for bid at the end of the Development Phase. Contracts for pre-construction activities such as access road construction; stockpile site preparation; aggregate processing; construction camp mobilization; field communications set-up; ROW clearing; timber salvage; and double jointing and stock piling of pipe would be awarded to specialist construction contractors with preference being given to local firms that can provide the required services on a competitive basis. Contracts would be awarded either after the final Decision to Proceed has been made at the end of the Development Phase or conditionally awarded prior to the final Decision to Proceed. Construction contract packages would be prepared by the EPCM contractors who would also provide construction management and construction inspection services.

b) Construction Schedule

The construction plan is based on completing all Pipeline System construction activities within two years. Pre-construction activities for the pipelines and pipeline facilities would start one year prior to mainline construction once all the necessary regulatory approvals are in place, and would continue for two years.

Compressor and meter station site preparation is scheduled to take place during pre-construction, which is assumed to be between June 2014 and April 2016. Installation of compressor and meter stations is scheduled to take place between April 2015 and May 2017.

Preconstruction activities for the GTP would begin at the same time as pre-construction for the pipeline, beginning with the labor camp and related infrastructure. Site preparation and construction of the GTP would follow as soon as possible after the necessary infrastructure is in place.

Final commissioning of all facilities, including the GTP, would begin in mid-2017, with initial gas flowing in late 2017. As part of the detailed execution planning to be done during the Development Phase, plans will be developed to coordinate the commissioning of the pipeline, all compression and metering facilities, the GTP and downstream facilities.

c) Construction Management

Construction contractors would be responsible for compliance with all technical, environmental and safety requirements, and with permit conditions. Nevertheless, TransCanada would retain overall accountability for construction work. EPCM contractors, under the direction of the PMT, would provide construction management and inspection teams to monitor and document the progress of the work, to ensure compliance and to provide a conduit for information between the construction sites and project management groups. Detailed construction management plans would be developed during the Development Phase that address pre-construction, pipeline and facilities construction, and associated off-site work such as pre-fabrication.

d) Pipeline Construction Seasons, Spreads and Contractors

Mainline construction activities would be completed during both the summer and winter seasons. In most cases, subject to fish and wildlife timing windows, the designation of an area of work as summer or winter construction would be dependent on the ability of the terrain to support construction equipment. Terrain that cannot support construction equipment during the summer without excessive gravel pad construction is normally designated as winter construction. In Alaska, it is assumed that the pipeline construction work would be completed in 12 sections (including Atigun Pass and Yukon River sections), using four contractors. Each package could include both summer and winter work. Preliminary assessments indicate that the Alaska Section of the pipeline route includes approximately three-quarters winter construction work, allowing the work to be completed in two years. This assumption will be validated during the Development Phase.

Determination of winter and summer construction sections for the Canadian portion of the route was completed using 1:10,000 scale geotechnical drawings and considering environmental constraints. The Canada Section has approximately equal proportions of summer and winter work, allowing the work to be completed in two years. Work in the Canada Section has been divided into 13 sections (including the Kluane Lake section) and is expected to be completed by three contractors over two summer and two winter construction seasons.

The Kluane Lake crossing in the Yukon would be treated as a special construction spread and awarded to a contractor that specializes in this type of construction. The current plan for the crossing includes dredging the banks of the lake, welding pipe sections, coating the pipe with concrete and pulling pipe sections across the lake. The plan would be reviewed during the Development Phase and be compliant with regulatory direction. The crossing is 4.2 miles long.

e) Construction Logistics

Each pipeline spread would be provided with one stockpile site for pipe, preferably located near the center of the spread. Stockpile sites would be surfaced with gravel to allow movement of material during all types of weather.

All field construction crews would be housed in temporary work camps during construction. Each pipeline spread would have a designated camp that would, where possible, be located near the center of the spread, beside or near a stockpile site. Camps would be operated in compliance with all applicable regulations.

Generally, access to the Project is available by existing roads and highways. Some short temporary access roads would be required in certain locations. Also, several permanent, high grade access roads will be required to provide access to compressor station sites.

Temporary facility sites would be removed and all disturbed areas would be reclaimed/restored in accordance with regulatory requirements. Reclamation/restoration plans would be developed and approved during the Development Phase and finalized during detailed design.

f) Pipeline Construction

Grading in Alaska would utilize conventional grading methods in non-permafrost areas. Gravel and snow pads would be constructed to protect the northern tundra and permafrost. Clearing of the pipeline ROW would generally be completed either one year or one season ahead of mainline construction activities. This would result in a longer effective construction season.

During previous expansions of TransCanada's Alberta System in the north-west corner of the province, areas of discontinuous permafrost were encountered. In developing and executing projects through these areas, TransCanada submitted Permafrost Protection Plans to Alberta Sustainable Resource Development, pursuant to requirements of the *Alberta Public Lands Act*. The intent of these plans was to communicate that TransCanada's construction practices for ROW preparation and post-construction reclamation would minimize the potential for permafrost melting. Timely approval was received for all of these plans. Procedures typically include: modified grading practices to lessen the extent of disturbance and the resulting loss of the protective layer of surface material; and, site-specific reclamation measures to hasten the re-establishment of stable ground vegetation cover, thereby minimizing the extent of exposure to thawing conditions. Through implementation of these plans, TransCanada has successfully reclaimed all of its existing ROWs in Canada that are in discontinuous permafrost.

Welding in both the Alaska and Canada Sections would be completed using mechanized welding equipment. The use of mechanized welding equipment would increase the productivity of the welding process and provide welds of consistently higher quality than welds completed manually.

Chain trenchers would be used for ditching through permafrost areas where necessary and geotechnical conditions permit. The use of chain trenchers would eliminate the need to drill and blast the permafrost, and reduce the amount of imported backfill. In non-permafrost areas, conventional ditching methods would be used, including excavators and wheel trenchers. Hard rock would be excavated by first drilling and blasting, then removing the broken rock using excavators. Discussions with construction equipment suppliers indicate that the heavy construction equipment in use today would have the capability to construct the pipeline.

The construction plan includes consideration of the use of horizontal directional drill crossing methods, where feasible. For watercourses that cannot be crossed using this method, a trenched installation method such as open-cut or isolation (flume, dam and pump) crossing methods would be used during the approved in-stream activity windows and with implementation of the appropriate environmental protection measures. Aerial crossings would be considered for some river crossings in Alaska where site conditions are not suitable for below-ground installation. This plan would be refined during detailed construction planning based on field studies, regulatory discussions, and a detailed review of the latest developments in HDD technology.

Generally the environmental mitigation objectives for stream crossings would be:

- to minimize the footprint of disturbance both in-stream and along the adjacent right-of-way;

- to minimize the duration of activity in the stream;
- to minimize potential erosion;
- to ensure no deleterious materials enter the stream; and
- to reclaim/restore the stream bed and banks to a stable condition.

Pipeline pressure testing would generally be completed during the same season as mainline construction. During detailed construction planning, consideration would be given to alternative integrity validation (described in the FEED Plan) and other testing alternatives such as using air as a test medium or using a freeze inhibitor in permafrost zones to prevent the test medium from freezing. TransCanada has extensive testing experience using different test media and methods. This experience would be invaluable in preparing test plans that would reduce the costs and risks associated with testing and avoid or lessen any potential environmental impacts.

g) Compression, Measurement and GTP Construction

The construction plan for compressor stations is based on constructing and shop testing compressor station modules at fabrication facilities inside and outside of Alaska. The modules would then be shipped to site for assembly, final testing and commissioning. The modular approach is expected to improve construction economics and reduce schedule risk. By completing more work inside the controlled environment of a shop and minimizing the amount of site work in remote northern locations, quality would also be improved. Field assembly would include the installation of prefabricated compressor station modules, prefabricated pipe and other components. Initial equipment and fabrication package checkouts would be conducted in the vendor shops prior to shipment to the field. Piping for all compressor stations would be prefabricated and coated before being shipped to site for installation.

It is noted however, that due to provincial road transportation restrictions, it may not be possible to take full advantage of modularization for all of the Canadian compressor stations. During the Development Phase, as part of logistics planning, the PMT would work with the appropriate authorities to address such restrictions. The outcomes from these consultations will govern the extent of modularization in the construction of these compressor stations.

The GTP would also be constructed using pre-fabricated component modules. The large size of these modules would require them to be transported via barges from fabrication locations inside and outside of Alaska. Modules would be offloaded at the existing dock and wharf facilities in Prudhoe Bay and transported overland to the GTP site via the existing road system.

h) Environmental Protection

TransCanada is committed to working cooperatively with the Federal Agencies, State and its resource agencies, as well as Canadian regulators, to develop ways to avoid or lessen the potential for adverse environmental effects due to the Project. The company is also committed to fulfilling its responsibility to comply with all agreed actions and all regulatory direction it receives. In this regard, TransCanada would work with regulatory agencies and key stakeholders in Alaska to determine the requirements for environmental

data collection and environmental protection along the Alaska Section. TransCanada would also update the significant amounts of previously collected environmental data for the Canada Section, and have discussions with Canadian regulatory agencies and key stakeholders to develop updated environmental protection measures for that portion of the Project.

The APP would operate under a comprehensive Environmental Management program to guide all aspects of planning, design, construction, operation, maintenance, and eventual decommissioning of the pipeline. TransCanada's approach to EM is based on the framework offered by TransCanada's corporate Health, Safety and Environment Management System. This management system is based on ISO 14001.

In its activities, TransCanada would be guided by its corporate *Health, Safety and Environment Commitment* (a copy of this statement is provided at the end of Section 2.9.1 "History of Compliance with Safety, Health, and Environmental Requirements"). TransCanada is committed to leadership and continual improvement in its HSE practices, in maintaining a safe and healthy workplace and in protecting the environment. For the APP, a series of Project-specific environmental plans would be developed to reflect the unique aspects of the different geographies along the pipeline route and to meet regulatory requirements and manage environmental risk.

i) SCADA and Gas Control

The SCADA design concept for the Canada and Alaska Sections is based on the SCADA functionality currently in use on the Foothills Pre-Build. Compressor station, meter station and pipeline operating conditions would be monitored remotely from TransCanada's Operations Control Center, and at O&M centers when required. Compressor stations, mainline meter stations and block valves would be controlled remotely through the SCADA communication system. Operating information for the Pipeline System would be recorded in a central data storage system.

j) Communications

The current plan for communications is based on the use of satellite services, similar to those that are currently available, for both mobile and fixed communications. This preliminary design includes mobile and fixed communication services during construction for both the owner and the contractors. It also includes permanent mobile and fixed communication services as well as SCADA facilities for operations.

SCADA and communications technology is an area that is continually evolving and a detailed SCADA and Communications Plan would be developed during FEED, considering the latest developments in the field.

k) Operation and Maintenance Facilities

It is proposed that there would be three regional O&M facilities located at Fairbanks, Alaska; Whitehorse, Yukon; and Fort Nelson, British Columbia. The O&M facilities would include office and warehouse facilities. Spare gas generators, chiller units and other equipment spares would be provided.

l) Commissioning and Start-up Plan

Commissioning and start-up functions would begin prior to the completion of construction. TransCanada would begin mobilizing commissioning and operations personnel in advance of their field assignments to provide adequate time for safety, environmental and operational training.

Timing for commissioning of the pipeline, compression and metering facilities will be dependent upon having available sufficient gas volumes and a sufficient length of continuous pipeline. Gas would be brought into the system from the Prudhoe Bay facilities (north end) and may also be brought into the system from the Boundary Lake facilities (south end), to reduce commissioning time. At the present time there are no suitable sources of commercial natural gas available near the middle of the APP route. However, should this gas become available in sufficient quantities prior to the start of commissioning, TransCanada would consider utilizing this gas to further reduce the overall commissioning timelines.

Commissioning the pipeline is estimated to take five months. Commissioning of the compression and metering facilities would take place after the completion of pipeline commissioning through each location.

The APP In-Service Date is scheduled for November 2017. Gas flow rates would increase to full contract volumes by early 2018.

A detailed Commissioning Plan would be developed as part of FEED, and further refined during detailed design.

m) Project Construction Completion

After all construction is complete, activities would continue to support successful reclamation/restoration of the ROW and to remove and reclaim/restore sites of temporary facilities and disturbances. This work would be carried out in accordance with all environmental protection plans and regulatory directions and would be carried out progressively along the route as construction cleanup is completed and ground conditions are suitable. Project completion is planned for 2019 and would be achieved with the finalization of all reclamation/restoration, as-built drawings and documents, QA/QC documentation and warranty work on the ROW.

n) Post-Construction

Once Project construction is complete, TransCanada would implement a series of post-construction monitoring activities. These activities would ensure that all reclamation/restoration requirements and commitments have been met. If any areas of concern are identified during the post-construction monitoring, appropriate measures would be developed and implemented.

7) Project Management Processes and Governance During Project Execution

As described in Section 2.1 “Development Plan:, TransCanada has developed a suite of processes, guides and templates that have been standardized across the organization under the auspices of the PMO. While the PMO Guides are structured to align with industry-standard processes as described in the Project Management Institute’s *A Guide to the Project*

Management Body of Knowledge and are well suited to a project that is structured in phases and divided into sub-projects, there may be advantages to including input from the EPCM contractors, based on their experience in executing very large projects. This would be explored during the Development Phase when detailed project management processes and procedures for the Execution Phase are being developed.

a) Standard Control Levels

Appropriate control levels would be put in place on each sub-project or component of the work to ensure that an appropriate level of effort is expended on controlling the work in the Execution Phase. Control levels for the various knowledge areas in all sub-projects would be in accordance with the guidelines set forth in the PMO *Project Controls Level Validation Guide* (see Appendix B1 "PMO Project Controls Level Validation Guide").

b) Scope Management

During the Development Phase a detailed Scope Management Plan would be developed for the Execution Phase. The plan would be based on TransCanada's PMO *Scope Management Guide* (see Appendix B2 "PMO Scope Management Guide") and incorporate processes and best practices of the EPCM contractor.

c) Schedule Management

A high level milestone schedule for the Execution Phase is included in this Application (refer to Section 2.6 "Project Schedule"). This schedule has been based on detailed work that was completed by TransCanada in recent years.

During the Development Phase, a detailed Schedule Management Plan would be developed for the Project Execution Phase. This would include a Project Master Schedule and supporting Detailed Schedules for all aspects of the work including regulatory requirements, environmental and socio-economic activities, procurement, logistics and construction lead times and constraints.

The Schedule Management Plan would contain processes, standards and requirements for updating schedules and reporting variances from the baseline schedule.

d) Cost Management

i) Cost Management Plan

During the Development Phase, a detailed Cost Management Plan would be developed for the Execution Phase. The plan would comply with TransCanada's processes but incorporate the best practices of the EPCM contractors. TransCanada's approach to cost management is further detailed in Section 2.3.2 "Managing Capital Costs".

ii) Cost Estimating

This Application includes a Class 5 (based on AACE International Recommended Practice No.17R-97) Cost Estimate for the Project Execution Phase that has been developed based on studies that were recently undertaken by TransCanada. Costs are

reflective of the current market (mid-2007) and are described in Section 2.5 "Project Cost Estimate".

Late in the Development Phase, a Class 3 cost estimate and risk analysis would be developed based on field studies, FEED work and more detailed procurement, logistics and construction planning, and would be a key input to the final Decision to Proceed. This Class 3 cost estimate would form a Project baseline budget for control during the Execution Phase.

iii) Decision to Proceed Milestone

The major project milestone "Decision to Proceed" marks the transition point between the Development Phase and the Execution Phase. This would be TransCanada's final go/no-go decision point in the Project.

Inputs to this decision would include:

- receipt of major regulatory approvals in Canada and the U.S.;
- binding bids received for all major materials and equipment;
- binding bids received for major construction contracts;
- financing in place;
- a Class 3 estimate that confirms that the Project Cost Estimate is in accordance with the parameters laid out in the Precedent Agreements, all Precedent Agreement conditions have been met or waived; and
- all final corporate inputs and approvals to the Decision to Proceed are in place.

e) Quality Management

During the Development Phase, a detailed Quality Management Plan would be developed for the Execution Phase. The plan would comply with TransCanada's requirements but incorporate the best practices of the EPCM contractors.

f) Risk Management

During the Development Phase, a detailed Risk Management Plan would be developed for the Execution Phase in accordance with TransCanada's PMO *Risk Management Guide* (see Appendix B6 "PMO Risk Management Guide").

For a Preliminary Risk Assessment of the overall Project, please refer to Section 2.7 Risk Assessment and Mitigation.

g) Procurement Management

During the Development Phase, a detailed Procurement and Logistics Plan would be developed for the Execution Phase that complies with the procurement requirements of the State of Alaska and other applicable jurisdictions. The Procurement and Logistics Plan would include requirements for contractor/vendor qualification; contractor/vendor selection; contract administration (invoicing, payments, changes to contracts and purchase orders, etc.); procurement logistics; and contract closure.

During the Execution Phase, procurement would be carried out by the EPCM contractors under the direction of the Procurement area of TransCanada's PMT.

h) Human Resources Management

During the Development Phase, a detailed Human Resource Management Plan would be developed for the Execution Phase.

The APP PMT for the Execution Phase would be similar in structure to that of the Development Phase but would see an increase in resources to ensure adequate oversight of the EPCM Contractors as the level of activity increases.

i) Communications Management

During the Development Phase, a detailed Communications Management Plan would be developed for the Execution Phase. The plan would be in accordance with TransCanada's PMO *Communication Management Guide* (see Appendix B9 "PMO Communication Management Guide").

For more information on stakeholder communication, refer to Section 2.2.2 "Stakeholder Issues Management Plan".

j) Regulatory Management

During the Development Phase, a detailed Regulatory Management Plan would be developed for the Execution Phase. The plan would be in accordance with TransCanada's PMO *Regulatory Management Guide* (see Appendix B10 "PMO Regulatory Management Guide"). The Regulatory Management Plan would include lists of permits, conditions and status for federal, state/provincial, municipal and other regulations, regardless of whether they are obtained by TransCanada, EPCM contractors, environmental consultants or construction contractors.

Regulatory Management is more fully described in Section 2.2.4 "Regulatory Plan".

k) Safety Management

Safety Management during the Execution Phase would be in accordance with TransCanada's *HS&E Management System*, *Contractor Safety Management Program* and PMO *Safety Management Guide* (see Appendices E, C, and B11 respectively).

As with all TransCanada projects and programs, project-specific safety targets would be established for the Project as whole and for sub-projects. Safety performance would be monitored and statistics for incident occurrence relative to hours worked and miles driven would be tracked. All major and critical incidents would be investigated, and actions and learnings communicated as appropriate. Safety performance for both the PMT and contractors would be reported to management on a monthly basis. TransCanada's commitment to safety would be communicated to all contractors working on the Project.

All project team members would be required to fulfill TransCanada's corporate requirements with regard to safety compliance and would be required to participate in contractor safety programs if participating in field activities.

i) Safety Plans

An Execution Phase Safety Plan would be developed for the Project as a whole and for each sub-project. These plans would describe the safety program; define roles, responsibilities, and minimum training and competency requirements for key personnel; define performance goals for the Project or sub-project; and communicate expectations regarding audits and inspections, and incident management.

Contractors would be required to develop project specific safety plans that comply with TransCanada's CSMP and that effectively address all potential risks on site. The safety plans would be required to meet all regulatory requirements and standards, and be acceptable to TransCanada. Safety training and orientations would be in compliance with applicable regulations and would be provided to all construction employees.

l) Change Control

Late in the Development Phase, the Development Phase Change Control Plan would be enhanced for the Execution Phase. The plan would continue to comply with TransCanada's requirements and incorporate processes and best practices of the EPCM contractors. As in the Development Phase, the Change Control Plan would provide a process for managing changes within the Project. In the Execution Phase the higher levels of activity associated with detailed design and construction will require a disciplined approach to change management to ensure that adverse impacts of changes are minimized.

m) Environmental Management

The management of environmental protection for a project as large and complex as the APP is a challenging undertaking that will require the application of a sophisticated management approach. TransCanada also recognizes that effective management and communication of the extensive compliance requirements among hundreds of workers, supervisors and managers will require a reliable and functional compliance monitoring system. The Project would utilize a variety of tools for implementation of the HSE Management System, including a customized software database that is capable of storing, updating, manipulating, and reporting information related to the various environmental protection programs. The software database would be capable of exchanging and updating Project information among field inspectors, environmental protection field staff and the management staff in the field offices. Project staff and regulatory inspectors would have real-time access to updated compliance information.

The Environmental Management Plan ("EMP") developed during the Development Phase would be used to manage and guide the environmental aspects of all construction activities during the Project Execution Phase. TransCanada's HSE Management System would provide the corporate framework for the EMP.

Prior to the commencement of construction, the Environmental Management contractors would procure qualified resources to provide environmental inspection and coordination services during construction. Environmental management staff would review all Project permits and approvals to ensure consistency and accuracy of direction received from various regulatory agencies. Project-specific environmental orientation and training

programs would be developed for delivery to all on-site personnel and visitors. TransCanada would ensure that all field inspection personnel complete the orientation and activity-specific training.

During construction, Project environmental staff would be focussed on the implementation of all environmental protection measures, and compliance with all environmental commitments and regulatory directions. Documentation would be maintained to monitor this compliance and to track items such as: modifications made to procedures; new issues and commitments that arise during construction; and, the resolution or progression of previously identified issues. The EM documentation during construction would form the basis for post-construction monitoring and follow-up, as well as continued learning for TransCanada in executing pipeline projects.

i) Organization

The PMT would be accountable for the management of design, procurement, and construction activities for the Project and for environmental compliance. The PMT would establish the EM organization that would implement the HSE Management System.

The EM staff assigned to implement the HSE Management System would support the execution of the program and the EPPs through all phases of the Project. The tasks that the EM staff would be responsible for include, among others:

- developing, establishing and maintaining the environmental protection programs and associated EPPs;
- interfacing with regulatory agencies and other stakeholders;
- gathering additional information as needed;
- providing information to support design of the Project;
- providing information to support construction planning, including detailed schedules, specifications and drawings as appropriate;
- providing assistance in ensuring that designs and plans are executed as part of the inspection and quality assurance programs; and
- post-construction monitoring to establish that the designs and plans were successful and to identify any necessary follow-up activities.

Project teams would complete design, construction planning, field inspection, and quality assurance activities. The EM staff would support and/or participate as appropriate on these teams to facilitate integration of the environmental protection programs. During construction, the EM staff would be fully engaged with integrating and implementing the environmental programs.

ii) Project Documents

One of the primary functions of the EM staff would be to produce and continually update a set of documents, which would provide environmental guidance to the other Project disciplines. The central document for Project Environmental Management would be the EMP, which would describe the immediate goals of each environmental program, the developmental milestones to achieve those goals, and the manner in

which each program contributes to design and planning elements. An EMP document would be developed to serve as a guide to implementation through integration of the environmental protection plans with the engineering and other technical programs through all phases of the Project.

Environmental Management Plan

The EMP would be a comprehensive guide to the integration of environmental requirements and considerations into all aspects of the Project. The EMP is the primary environmental document for the Project and presents the Project's environmental protection approach. The Project would coordinate with the ADFG, ADEC, ADNR and other agencies as appropriate to the Alaska Section, in parallel to the appropriate Canadian regulatory agencies, in the identification of environmental baseline information and protection measures that would aid in development of the EMP document.

Environmental Protection Plans

The EPPs would identify specific mitigation measures. The EPPs would provide a mechanism for communicating and incorporating environmental protection into the Project plans and designs. The format for the EPPs would include the following elements:

- comprehensive mitigation plans and approaches for the identified environmental concerns;
- reference to the applicable reports that document the results of specific environmental studies and/or site-specific environmental assessments;
- sufficient environmental information concerning design and schedule elements so that on-site decision making is effective and efficient;
- definitions of the roles, responsibilities, and authorities for implementation of the plans and for decision-making as it may be needed on-site during construction;
- direction for appropriate communication to both internal and external interests of any environmental issues that may arise; and
- identification of the mechanisms that would be used to ensure environmental compliance by construction contractors.

The EPPs would be the end product of planned research and design work, presenting a responsible, comprehensive final design to protect environmental resources. The EPPs would be included as sections within the EMM document as well as in the prime construction contract.

Sensitive Environmental Areas and Activity Restrictions

The Project would undertake studies to identify sensitive environmental areas and associated activity restrictions along the Project ROW. This would include field studies and identification of sensitive wildlife areas along the Project route. These would be mapped in the Project GIS database to support the development of pipeline

alignment sheets. The locations of these areas and the associated restrictions would be determined using contemporary information including, among others, the existing Zones of Restricted Activity ("ZRAs") established for the TAPS.

Stream Crossing List and Activity Restrictions

As with wildlife resources, studies would be undertaken to evaluate streams and rivers crossed by the pipeline route, including the presence of fish. The list of streams and the associated restrictions may include, among other public sources, stream lists and activity restrictions developed for the TAPS.

Environmental Control Schedules

The environmental control schedules are a series of critical path schedules that outline the interaction between the EMP and the other Project plans. These schedules would be developed for several of the environmental protection programs and would be updated as appropriate.

Environmental Training Materials

The EMP would guide the development of appropriate training materials as part of the environmental orientation program.

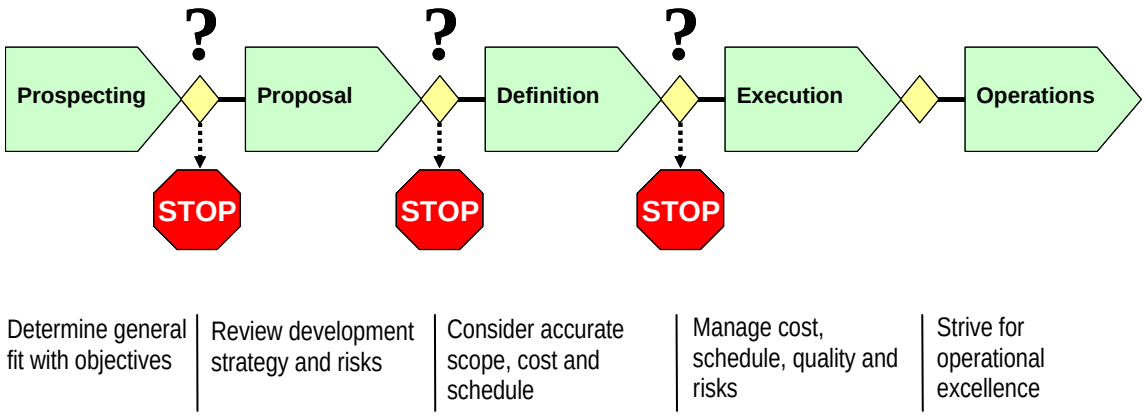
2.3.2 Managing Capital Costs

TransCanada has in place tools and techniques for managing capital costs for projects through both the development and execution phases. All cost estimating and cost control processes are tied to TransCanada's Work Breakdown Structure system. The WBS facilitates a logical structuring of the project allowing for greater consistency in cost tracking and cost allocation. The WBS structure allows the project to be sub-divided into smaller more-manageable sub-projects while still retaining the ability to track and forecast the overall project.

1) Development

a) Stage-Gate Management System

The Stage-Gate management system divides the development phases of a project into several segments. Between each segment or 'Stage' there is a formal management review, or 'Gate', at which time the deliverables of the last stage of the project require approval before the project can proceed to the next stage. Funds are only approved for the next stage of the project, ensuring that the project's progress and status are subject to formal management approval at regular intervals and that funding decisions are closely tied to the successful completion of all deliverables from each stage.



TransCanada's Project Development Process

Each TransCanada project goes through the stages of Prospecting, Proposal, Definition, and Execution. Additionally, 'Check-Points' are inserted at strategic points between Stages-Gates in order to facilitate additional management review and control. On award of the AGIA License, the APP would begin in the Proposal Sub-Phase (equivalent to the Proposal Phase in TransCanada's Stage-Gate management system) leading up to the Open Season, at which point it would transition into the Definition Sub-Phase of the Development Phase.

b) Estimating Classes

Estimates would be progressively refined as the Project advances through the Development and Execution Phases. Consistency in WBS would support effective cost and scope tracking. Detailed quantitative risk assessments would be performed for each class of estimate, and risk mitigation plans would be developed and incorporated into the Project execution plans. Contingency would be set based on the results of the quantitative risk analysis.

c) Contracting Strategy

TransCanada would also manage capital costs through contracting strategy with its vendors and contractors. TransCanada has considerable experience in writing and managing many types of construction contracts including Lump-Sum, Time & Materials, Unit Price, and Target Price contracts and is capable of scaling its management systems to fit the appropriate contract situation.

It is standard TransCanada practice to negotiate and execute contracts for pipeline construction and major materials prior to the final sanctioning of the project. As a result of this approach, approximately two-thirds of the project's capital costs can be contracted prior to the commencement of construction. For the APP, TransCanada would plan to have binding bids for major contracts and materials in place ready to execute prior to the final Decision to Proceed, where possible. However, as the required lead time for pipeline construction is long (contractors will need time to order equipment and train workers), there may not be sufficient time to bring scope definition to the point where bids for fixed prices or rates are feasible. Instead, TransCanada would consider

conditionally awarding pipeline construction contracts up to two years ahead of construction and incorporate mechanisms into the contracts to provide for cost escalation and cost adjustments for scope refinement, or cancellation of the contracts should the project not proceed to Project Sanction.

2) Execution

Construction progress would be reported daily by field project controls personnel and reported to head office staff where work is aggregated, recorded against the appropriate WBS and matched to the budget and schedule. Each facility and pipeline spread would have project control personnel assigned who would be responsible for checking timesheets, recording construction progress, and reconciling planned with actual progress.

Invoices, timesheets and progress reports would be submitted to Project Controls staff located at the Project office. Invoice payments would then be reconciled with field reports in order to ensure payment accuracy.

Hours and materials would be logged against the cost estimate using the WBS system and progress recorded against the schedule. By evaluating incurred costs and progress against the cost estimate and schedule, an accurate forecast-to-complete would be developed for each WBS unit. Work items that trend over budget and/or behind schedule would then be analyzed for measures to mitigate those issues and subsequent mitigation actions would be worked into the Project plans. Cost and schedule management would be facilitated using an Earned Value approach.

2.3.3 Project Labor Agreement

TransCanada commits to negotiate, before construction, a project labor agreement to the maximum extent permitted by law, where a “project labor agreement” means a comprehensive collective bargaining agreement between TransCanada or its agent and the appropriate labor representatives to ensure expedited construction with labor stability for the Project by qualified residents of the State.

2.3.4 Alaska Hire

TransCanada commits to the maximum extent permitted by law to:

- hire qualified residents from throughout the State for management, engineering, construction, operations, maintenance, and other positions on the Project;
- contract with businesses located in the State;
- establish hiring facilities or use existing hiring facilities in the State; and
- use, as far as is practicable, the job centers and associated services operated by the Department of Labor and Workforce Development and an Internet-based labor exchange system operated by the State.