



File OF-Surv-OpAud-T260-2016-2017 0101  
6 September 2017

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President and Accountable Officer  
Trans Mountain Pipeline ULC  
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Calgary, AB T2P 5J2  
Email [REDACTED]

Dear Mr. Anderson:

**Notification of the National Energy Board's (Board or NEB)  
Final Audit Report Trans Mountain Pipelines ULC (TMPU)**

On 13 April 2017, the Board informed TMPU of its intent to audit the Trans Mountain Expansion Project (Project). The audit was focused on TMPU's management system elements and sections of the *National Energy Board Onshore Pipeline Regulations* (OPR) which were relevant to the scope of the audit. The objective of the audit was to determine if TMPU has established the necessary oversight measures to manage construction-related safety and environmental protection for construction of the Project.

A Draft Report documenting the Board's evaluation of TMPU's oversight measures to manage construction related safety of the project was provided to TMPU on 4 August 2017 for review and comment. On 11 August 2017, TMPU submitted its response and its Corrective Action Plan to address all of the Board's findings.

After a review and evaluation of the feedback provided by TMPU, The Board has agreed to several minor edits to the audit report. In addition, the Board has included two new Appendices to the audit report: one which lists the company representatives interviewed during the audit; and the other is the Board-approved Corrective Action Plan (CAP).

The scope of the audit included relevant sections of the OPR for safety and environmental protection as they apply to the Project during the pre-construction phase. The regulatory requirements evaluated in this audit are detailed in the Board's audit assessment tables, attached to the report. The Board's findings were classified as Compliant, Non-Compliant, or Not Assessed.

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The Board noted that several processes, programs and activities were not fully established at the time of the audit. In several instances this resulted in the Board finding that TMPU was not in compliance with the requirements of the OPR.

The Board found that there were non-compliances in the areas listed below, amongst others:

- Quality Assurance Program;
- Hazard analyses;
- Organizational structure and corresponding competency and training requirements;
- Definition of inspection and monitoring requirements;

In consideration of the findings of non-compliance, the Board concludes that, at the time of the audit, TMPU had not yet established the necessary oversight measures to manage construction-related safety and environmental protection during the construction of the Project.

The Board acknowledges that since the completion of on-site audit activities, TMPU has developed and submitted to the Board its CAP to rectify the non-compliances noted during the audit. The Board acknowledges TMPU's pro-active efforts to demonstrate compliance for the findings of non-compliance.

The Board hereby approves TMPU's CAP submitted by letter dated 11 August 2017 in response to the findings identified in the Board's audit with the exceptions noted herein.

The Board notes the following:

- TMPU has included milestones for each CAP. These milestones will be verified during implementation assessment meetings planned for the period 28-30 August, 2017.
- Commitments described in the CAP will be verified during the implementation assessment meetings.
- CAPs will be reviewed to verify that they include ongoing preventive measures to prevent recurrence.

The Board finds TMPU's proposed approach to address the deficiencies is acceptable for findings 2, 4, 5, 10, 11, 12, 13 and 15. For all other findings refer to Appendix VII of the attached document for additional Board direction and guidance. All findings that were not accepted by the Board must be re-submitted by TMPU in as short a timeframe as possible to prevent delays in the start of construction.

The Board will post this Final Audit Report and the approved CAP on its website. Prior to publishing the report, TMPU will be offered an opportunity to review the report and request redactions based on the *Access to Information Act*. The Board will continue to monitor and assess all of TMPU's corrective actions and areas that could not be assessed at the time of the audit to ensure the safety of people and the environment.

The Board will continue to monitor the implementation and effectiveness of TMPU's management system and programs through targeted compliance verification activities as a part of its on-going regulatory approaches to oversee the Project's construction and operation.

If you require any further information or clarification, please contact Mark Tinney, Lead Auditor at the National Energy Board at telephone 1-800-899-1265.

Yours truly,

*Original signed by L. George for*

Sheri Young  
Secretary of the Board

c.c.

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Board



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**Trans Mountain Pipeline ULC  
Pre-Construction Compliance Audit Report  
File: OF-Surv-OpAud-T260-2016-2017 0101**

**Trans Mountain Pipeline ULC  
Suite 2700, 300 – 5<sup>th</sup> Avenue SW  
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**3 August 2017**

## Executive Summary

In accordance with *Section 49(3)* of the *National Energy Board Act* (NEB Act), the National Energy Board (NEB or the Board) conducted a compliance audit of Trans Mountain Pipeline ULC (TMPU) during the period from 12 April to 2 June 2017.

This report documents the Board's audit of TMPU Expansion Project (TMEP or Project). The audit was focused on TMPU's management practices and sections of the *National Energy Board Onshore Pipeline Regulations* (OPR) which were relevant to the scope of the audit. The objective of the audit was to determine if TMPU has established the necessary oversight measures to manage construction-related safety and environmental protection during construction of the Project.

The Board conducted the audit using the audit protocols attached in Appendix 1 of this report that are focused on safety and environmental protection as they apply to TMPU's anticipated construction activities. The Board assessed whether TMPU's documentation, processes and activities complied with the legal and other requirements under the Board's authority listed below:

- The *NEB Act*;
- The *OPR*;
- Any Conditions contained within applicable Certificates or Orders issued by the Board; and
- Requirements of any applicable NEB Safety Advisories.

During the audit, a number of process and program documents within the scope of the audit were assessed for compliance. Many of these documents relate to Conditions attached to the approval of the Project. Compliance to those Conditions are evaluated by the Board outside of this audit. As a result, this audit did not duplicate its assessment of these Conditions. The status of these Condition assessments can be reviewed on the NEB's public website through the use of the Trans Mountain Interactive Conditions Tool<sup>1</sup>.

There were 37 protocol items listed in the audit protocol attached in Appendix 1. Of those, there were 11 in which the Board did not identify any compliance issues; 1 was not assessed; 15 were found to be non-compliant; and 10 the Board was unable to assess at the time of the audit.

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<sup>1</sup> <http://www.neb-one.gc.ca/pplctnflng/mjrpp/trnsmntnxpnsn/cndtnstl-eng.html>

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The Board identified a number of regulatory requirements that could not be definitively assessed as either compliant or non-compliant during the audit. This was due to the stage of Project development, i.e., the required process or program was not yet fully developed and they were not immediately required to be implemented by the Project at the time of the audit. In order for the Board to evaluate a process, program, or activity for compliance, the activity or process has to be evaluated against a specific regulatory requirement. If the process or activity being evaluated is not yet being carried out because it is not yet required for the Project, the Board is unable to assign a finding of either compliant or non-compliant. The Board will follow up on all protocol items that could not be assessed through additional compliance verification activities as part of its regulatory oversight of the Project.

In this audit, the Board found non-compliances as summarized below.

- TMPU was unable to demonstrate how the Project has been integrated into the TMPU management system (ISLMS) in a manner that meets the requirements of OPR s. 6.1 (Refer to Appendix 1 Protocol Item AP-TMPU-01);
- TMPU's policy for the internal reporting of hazards, potential hazards, incidents and near-misses does not meet the requirements of the OPR s. 6.3(1)(a) (Refer to Appendix 1 Protocol Item AP-TMPU-02);
- TMPU has not created an organizational structure for the Project which meets the requirements of the OPR s. 6.4 (Refer to Appendix 1 Protocol Items AP-TMPU-03);
- TMPU has not developed a process to identify all hazards and potential hazards or created a hazard inventory related to the Project in accordance with the requirements of the OPR s. 6.5(1)(c) and (d) (Refer to Appendix 1 Protocol Items AP-TMPU-12 and 13);
- TMPU has not analyzed all of the risks or developed corresponding controls associated with the Project hazards and potential hazards in accordance with the requirements of the OPR s. 6.5(1)(e) and (f) (Refer to Appendix 1 Protocol Item AP-TMPU-14 and 17);
- TMPU has not developed a management of change process which meets the requirements of the OPR s. 6.5(1)(m) (Refer to Appendix 1 Protocol Items AP-TMPU-22);
- TMPU has not developed a process to communicate all special Conditions associated with the Project; all special safety practices and procedures necessitated by the NEB Conditions specific to the construction; and inform the contractor of the contractor's responsibilities in a manner which meets the requirements of the OPR s. 6.5(1)(l) (Refer to Appendix 1 Protocol Item AP-TMPU-26);



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- TMPU has not developed an inspection and monitoring plan for the Project in accordance with the requirements of the OPR s. 6.5(1)(u) (Refer to Appendix 1 Protocol Items AP-TMPU-30);
  - TMPU has not developed a process to ensure issues of concern and/or requiring immediate attention found during monitoring activities are properly addressed in a timely manner in accordance with the requirements of the OPR s. 6.5(1)(u) (Refer to Appendix 1 Protocol Items AP-TMPU-31 and 32);
  - TMPU was not implementing all of the requirements of its Quality Management Plan as per the requirements of the OPR s. 15;
  - TMPU's legal list does not include all referenced standards in accordance with the requirements of the OPR s. 6.5(1)(h) (Refer to Appendix 1 Protocol Item AP-TMPU-36).

Based on the evaluation of the results of its audit, the Board is of the view that, at the time of the audit, TMPU had not yet established all of the necessary oversight measures to manage construction-related safety and environmental protection for the construction Project.

The Board acknowledges that TMPU has submitted a proposed Corrective Action Plan (CAP). The Board has reviewed and approved this CAP, with guidance and direction as noted in the covering letter of this audit report. TMPU is required to implement its CAP in accordance with the methods and timelines described in the CAP at Appendix VII of this report. The Board will review the deliverables as outlined by TMPU's CAP submission during implementation assessment meetings planned for the period August 28-30, 2017. Each finding will be considered resolved when all of the deficiencies as described in the report have been addressed in accordance with the legal requirements, the commitments and the actions described in the CAP. The Board will also continue to monitor the overall implementation and effectiveness of TMPU's management system and construction activities through targeted compliance verification activities as a part of its ongoing regulatory oversight of the Project.

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## 1.0 Introduction

In accordance with *Section 49(3)* of the *National Energy Board Act* (NEB Act), the National Energy Board (NEB or the Board) conducted a compliance audit of Trans Mountain Pipeline ULC (TMPU) during the period from 12 April to 2 June 2017. TMPU is an affiliate of Kinder Morgan Canada Inc. (KMC). An overview of the audit process and an explanation of definitions and abbreviations can be found in Appendices 2 – 4.

### 1.1 Audit Objective

The objective of this audit was to assure that TMPU has established the necessary oversight measures to manage construction-related safety and environmental protection considerations for its Trans Mountain Expansion Project (TMEP or Project).

As the audit was focussed on the pre-construction phase of the Project, the Board only required TMPU to demonstrate that it had developed the necessary processes and activities for the Project. This audit did not test implementation as the construction activities had not yet been initiated at the time of the audit. The Board reviewed relevant processes, programs, and activities of the Project including:

- Integration of the Project with TMPU's management system;
- Organizational Structure, Roles and Responsibilities;
- Competency, Training and Evaluation;
- Hazard Identification, Risk Assessment and Control;
- Communications;
- Inspection, Measurement and Monitoring;
- Quality Assurance;
- Management of Change Process; and
- Legal Requirements.

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## 1.2 Audit Scope

The scope of the audit included relevant sections of the *National Energy Board Onshore Pipeline Regulations* (OPR) for safety and environmental protection as they apply to the Project during the pre-construction phase. The audit did not include TMPU's Security Management Program as it will be reviewed by the Board through other, more appropriate, planned compliance verification activities.

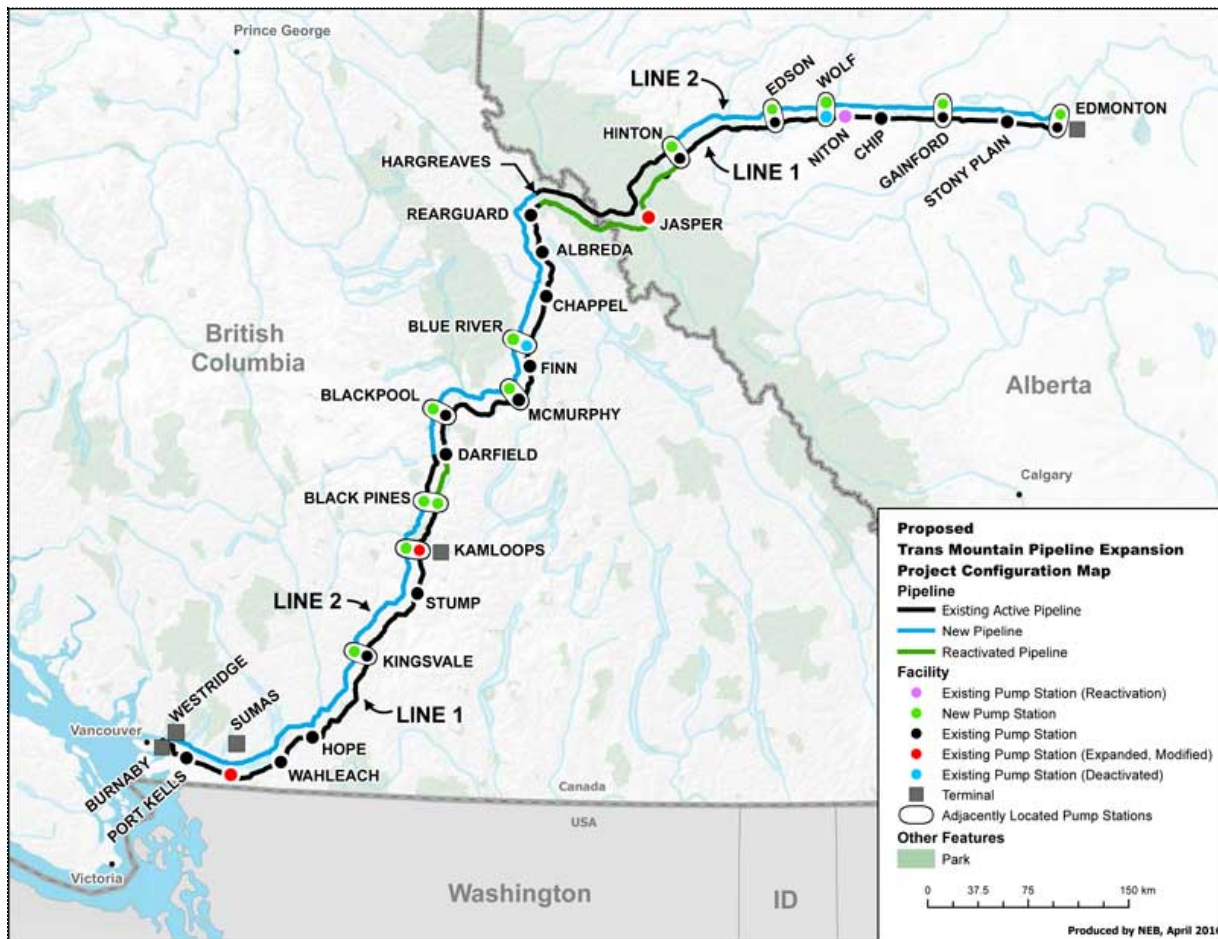
## 1.3 Audit Criteria

The Board assessed whether TMPU's documentation, processes and activities complied with the legal and other requirements under the Board's authority listed below:

- The *National Energy Board Act*;
- The *Onshore Pipeline Regulations*;
- Any Conditions contained within applicable Certificates or Orders issued by the Board; and Requirements of any applicable NEB Safety Advisories.

## 2.0 Project Overview

TMPU, an affiliate of KMC, submitted a facilities application to the Board in December 2013. The application included the construction of a pipeline from a terminal in Edmonton, Alberta to terminals in Burnaby, Sumas and Westridge in British Columbia as shown in the map below. The Project will involve the construction of approximately 980 km of new pipeline and the reactivation of 193 km of existing pipeline. Twelve new pump stations will be built along the route and nineteen new petroleum storage tanks will be built; 14 in Burnaby, 1 in Sumas and 4 in Edmonton. In addition, the Westridge Marine Terminal in Burnaby will be expanded with three new berths.



The Governor in Council approved the Project in November 2016. A Certificate of Public Convenience and Necessity and other authorizations allowing the Project to proceed were issued and became effective on 1 December 2016. The Project is still subject to a number of Board Conditions being satisfied by TMPU prior to, during, and post-construction.

### 3.0 Description of the Audited Processes and Activities

#### 3.1 General

In this section of the audit report, the processes and activities the Board evaluated through document review and interviews will be discussed. The Board's assessment of compliance of the processes and activities will follow in Section 4.

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### 3.2 Organizational Structure, Roles and Responsibilities

The Project is managed by the Vice-President of the Trans Mountain Expansion Project (VP TMEP) who reports directly to TMPU's Accountable Officer (AO). The Project is divided into three sub-projects: pipeline construction; facilities construction; and lower mainland construction. Each sub-project is headed by a project director who reports to the VP TMEP.

The Project management team reporting directly to the VP TMEP includes:

- Senior Director Project Affairs;
- Environmental Manager;
- Health and Safety Lead;
- Security Lead;
- Director of Engineering;
- Controller;
- Director Supply Chain Management; and
- Chief Quality Assurance Lead.

At the time of the audit all of the above positions were staffed with the exception of the Chief Quality Assurance Lead position.

The Board was advised that the Project would be retaining the services of a construction management and inspection contractor who would work under direction of TMEP staff to provide quality, safety and environmental oversight of general construction contractors ensuring that all contractors will follow the Trans Mountain approved execution plans. The general construction contractors are to be hired separately by TMPU and will be used to construct the pipeline and facilities. At the time of the audit, the final selection of a construction management and inspection contractor and the general construction contractors had not been completed.

TMPU stated that the development of the organizational structure for the construction management and inspection organization will be directed by Trans Mountain, in consultation with the construction management and inspection contractors and will include the determination of the required number and types of positions as well as the establishment of the roles, responsibilities and competencies for each position.



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### 3.3 Integration with the TPU Management System

For existing pipeline operations, TPU has developed an Integrated Safety Loss Management System (ISLMS) which is its management system as per the requirements of the OPR 6.1. During the audit, the Board did not evaluate the entirety of the ISLMS as it was beyond the scope for this focused audit. Instead, the Board evaluated if KMC met the requirements of the OPR s. 6.1(c), which states: *A company shall establish, implement and maintain a management system that (c) applies to all the company's activities involving the **design, construction,** [emphasis added] operation, or abandonment of a pipeline and to the programs referred to in section 55.* TPU indicated that it would be using certain components of the ISLMS on the Project, however, not all components would be used.

As stated in TPU's Major Projects Management Plan (MPMP) *"The Major Projects Program, is one of the management programs within the ISLMS."* The MPMP document also states *"KMC is committed to the development, implementation, and maintenance of an Integrated Safety and Loss Management System (ISLMS) that addresses all aspects of the pipeline lifecycle to protect the safety and security of people, the environment and KMC's business assets."* The document goes on to say the following *"The Major Projects Management Program is responsible for the technical development, design, construction, and commissioning of a portfolio of growth related pipeline projects, facilities projects, and integrated projects that include both pipelines and facilities."* The Board noted that this demonstrates how construction activities are to be integrated into the MPMP and as a result part of the TPU management system.

The MPMP document states *"(the Plan) is the governing document for the Major Projects Program. The Plan outlines the key components of the program and describes how the standards, procedures and practices that the program utilizes will be applied to comply with ISLMS requirements."* The MPMP document explains how a major project would interact with existing ISLMS standards, procedures, frameworks and programs. Some examples of these from the MPMP document would include the following:

- Hazard and Risk Management;
- Legal Requirements;
- Goals, Objectives, Targets, and Performance Measures; and
- Training, Competency and Evaluation.

At the time of the audit TPU stated that it intends to develop a Project Management Plan to incorporate management system elements into the Project. However this was not available for review at the time of the audit.



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### 3.4 Competency, Training and Evaluation

TMPU stated that it will be directly contracting the services of general construction contractors for the construction of the pipeline and facilities. Part of the general contractor competency evaluation process will be carried out using ISNetworld®.

ISNetworld® is a contractor management company that manages the safety compliance for many oil & gas companies globally. ISNetworld® collects safety, procurement, quality and regulatory information from contractors and suppliers and verifies its accuracy and reports on its results. TMPU explained that the construction management and inspection contractor will play a role in evaluating the qualifications and competencies of the construction contractors' personnel brought on to the Project.

A component of its ISLMS that the Project will be using is the Contractor Competency Assurance Plan (CCAP). The CCAP is an existing set of processes for verifying that contractors conducting work on behalf of TMPU are qualified and competent to perform their duties. The CCAP establishes the systems and requirements to ensure that contractors conducting their work *“are qualified and perform their assigned tasks in a manner that is safe, ensures the security of the pipeline, and protects the environment”*.

As part of the CCAP process, contractors will be required to provide documentation to support the qualification of their employees prior to the start of work in order to verify the qualifications and competencies listed in ISNetworld®. The Project team will apply the CCAP to the roles and positions identified by the construction management and inspection contractor. The Board was advised during interviews that field verification checks will be carried out by a qualified Project representative to ensure the general construction contractors are demonstrating competent performance in the execution of their work.

As part of the CCAP, a Contractor Qualification Specification (CQS) will be developed by the construction management and inspection contractor for each inspector role for review and approval by the Project team. A CQS is a document that *“describes the responsibilities associated with a specific role to be performed by a contractor and specifies the necessary training and qualifications associated with that role.”* Competency requirements for the work to be performed by contractors and each role required to perform the work shall be established in CQSs, as required. The CCAP documentation indicated that CQSs will also be applied to any contractor roles deemed highly technical or where there is a high risk to safety, security or protection of the environment.





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Contractor training, qualification and competency requirements will be managed separately for the Project. The CQSs for all construction contractor personnel shall consist of:

- Task-specific training required by occupational health and safety regulations;
- Requirements of the Canada (Oil and Gas) Midstream Training Qualifications including core and job-specific training as supplied by the contractor; and
- The completion of the Project orientation process.

Minimum safety training and qualification requirements for Project personnel and contractors are outlined in the Trans Mountain Expansion Project Health and Safety Management Plan (Project HSMP). Company personnel and consultants will be trained under the KMC KEEP Canada Practice Training Implementation Plan. KMC KEEP was identified as an on-line learning management system that ensures workers have core and discipline-specific competencies. It requires workers to complete on-line courses that provide required training and evaluation for competency.

The Board was advised during interviews that the Project orientation training for employees, contractors and visitors will consist of 4 levels of training. The four levels of training, as outlined below, will build upon one another such that anyone who takes Level 3 training will have to complete the lower levels as well:

**Level 0:** Level 0 training provides visitors with basic information on safety, security and environment;

**Level 1:** This level of training is intended for general labourers and will consist of 4 hours of training to provide a general understanding of health, safety and environmental issues followed by a competency test;

**Level 2:** Level 2 training is intended for foremen and managers and will consist of a 4-hour training session to provide a more detailed understanding of environmental issues followed by a competency test;

**Level 3:** This level of training is for inspectors and monitors and will consist of a half day of training with the focus to provide a more detailed understanding of environmental issues, followed by a competency test.

None of the training was available for review at the time of the audit.

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### 3.5 Hazard Identification, Risk Assessment and Control

The Project management team advised the Board during interviews that it intends to issue the construction contractors with a basic inventory of hazards, risk assessments and controls. TMPU provided their Unified Hazard Listing and Risk Register for their operational facilities to the Board as part of the audit documentation.

Review indicated that, while it does contain some construction related hazards, it was not specific to the Project. TMPU staff indicated that it will be requiring its construction contractors to review, update and amend the list based on site specific conditions for their respective construction spreads. The site-specific hazard analyses, completed by each construction contractor are to be submitted to the Project management team for review and approval. The Project management team stated that following submission and approval it will create a unified list of hazards and potential hazards for the entire project.

TMPU had developed a Project specific Risk Register; however, it was developed a high level for Project development with risks such as weather related construction delays and delays in mainline pipe being shipped to the work sites. The Register was not developed in a manner that would allow for application to the management of workers at the various construction sites.

At the time of the audit, TMPU was unable to demonstrate that it had established a hazard inventory or implemented a process for analyzing hazards for the construction Project.

### 3.6 Communications

The Project management team advised the Board during interviews that it intends to develop a Project Construction Internal Communication Plan based on the ISLMS Internal Communication Standard. The Board was also advised that construction communication plans for communicating between the Project team and its contractors are currently under development, and were not available at the time of the audit.

The Board was provided with a draft copy of the Project's Stakeholder Engagement and Communications (SE&C) Construction Execution Plan for communicating with external stakeholders. The plan addresses the engagement and communication strategies and activities required for the construction and operation of the Project. As indicated in the draft SE&C Construction Execution Plan, the aim is *"To ensure communications and engagement opportunities are appropriately tailored to the needs and interests of local communities, engagement activities have been divided into pipeline corridor communities (those potentially affected directly by the proposed pipeline and related facilities) and marine corridor communities (those potentially affected by the incremental increase in project-related marine vessel traffic)."*



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Some of the objectives of the plan were:

- *“identify all areas of work to be undertaken by the SE&C team in the lead up to and during construction;*
- *identify roles and responsibilities, including those of contractors, support project teams to their respective construction execution plans, and*
- *identify and complete all regulatory requirements.”*

The Board was advised during interviews with TMPU personnel that TMPU intends to establish a process to communicate all special conditions associated with the Project. This includes all special safety practices and procedures as required by the NEB Conditions to inform the contractors of their responsibilities. This training had not been developed at the time of the audit.

The Board was advised during interviews with TMPU personnel that Requests for Proposals (RFPs) used in the selection and hiring of contractors will be used to relay important information to the contractors to make them aware of special conditions associated with the Project. However, the Board was unable to verify through a review of the Project Procurement Execution Plan and the Project RFP & Contracts Award Procedure that RFPs will be used to communicate important information such as company commitments or Board Conditions to contractors.

### **3.7 Inspection, Measurement and Monitoring**

TMPU has prepared and provided for review a compliance management plan (CMP) that presents a framework to achieve compliance as required by the Board’s approval Conditions. Construction contractors will be required to prepare Contractor Compliance Management Plans (CCMPs) with detailed site-specific processes and procedures to execute the Project’s specifications, documents and work plans. The CCMPs are to demonstrate compliance with legal and other requirements applicable to the Project including approval Conditions and commitments. The CCMPs are to be reviewed and approved by the Project management team.

Section 2 of the CMP describes how the Project management team will track its commitments and compliance to all Board Conditions, environmental plans, ancillary permits and approvals. The CMP calls for the creation of a monitoring plan. The Project management team advised the Board during interviews and the Board verified through document review that the development of the monitoring plan will be the responsibility of the construction management and inspection contractor, once hired. The construction management and inspection contractor will be required to identify inspection and monitoring requirements, create a monitoring plan including organizational requirements and submit it to the Project management team for review and approval.

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### 3.8 Quality Assurance

The establishment and implementation of the QMP was one of the Project's Board approval Conditions being assessed through parallel compliance verification activities. The status of the QMP condition compliance assessment can be reviewed on the NEB's public website through the use of the Trans Mountain Interactive Conditions Tool<sup>2</sup>.

In this audit, the Board reviewed the quality assurance program for the perspective of the project implementation stage and the organizational structure. At the time of the audit the Board noted that the Chief Quality Assurance Lead position was not staffed.

While the Project does have a QMP, with no one staffed in the Lead position, the Board was unsure how all aspects of the plan were being implemented at this late stage in the pre-construction process. At the time of the audit, TMPU has pre-approved a number of vendors and material suppliers; signed a contract for the purchase of piping and plate material; and has acquired several gate valves for one portion of the Project.

Through interviews and documentation review, the Board identified that TMPU did provide quality assurance oversight in the purchase of several gate valves. They did this by having a third party engineering consultant to witness and document vendor equipment tests on the valves. Additionally, through interviews and documentation review, the Board identified that TMPU had retained the services of a third party engineering consultant to evaluate pipe manufacturing facilities and pipe coating facilities as an early stage pre-construction activity. TMPU had also sent a representative to the pipe manufacturing and pipe coating facilities to review site safety conditions.

### 3.9 Health and Safety Management Plan

The Board reviewed the Project HSMP which is to be used by the construction contractors to develop their own Project Specific Safety Plan (PSSP). The Board reviewed TMPU guidance notes and proposed outline for the PSSP manual. Once the services of the general construction contractors have been retained, each contractor is to develop a PSSP and submit it to the Project management team for review and approval. However, this had not yet been completed when the audit took place. The Board found the Project HSMP to be ready for contractor development of their PSSP. The establishment and implementation of the HSMP was one of the Project's Board Conditions being assessed through parallel compliance verification activities. The status of the HSMP condition compliance assessment can be reviewed on the NEB's public website through the use of the [Trans Mountain Interactive Conditions Tool](#).

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<sup>2</sup> <http://www.neb-one.gc.ca/pplctnflng/mjrpp/trnsmntnxpnsn/cndtnstl-eng.html>

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### 3.10 Environmental Protection Plan

The Board reviewed the environmental protection plan (EPP) for each project sub-component including mainline pipe, facilities and terminals. Each EPP provides a number of mitigation measures to be used by the Project management team, contractors, and sub-contractors for all stages and aspects of the Project construction. The establishment and implementation of the EPPs was one of the Project's Board Conditions being assessed through parallel compliance verification activities. The status of the EPP Condition compliance assessment can be reviewed on the NEB's public website through the use of the [Trans Mountain Interactive Conditions Tool](#).

### 3.11 Emergency Response Plan

At the time of the audit, the Project management team provided the Board with a draft of the Project Construction Emergency Response Plan (ERP) for review. The Board verified through document review and during interviews with TMPU personnel that each construction contractor will be required to prepare their own Site-specific ERP (SSERP) and submit it to the Project management team for review and approval.

Through a review of the draft ERP, the Board determined it will be up to each construction contractor to ensure third party emergency responders within their construction spread are made aware of the work that is occurring, the associated hazards and site-specific emergency response procedures.

The submission of the ERP is one of the Board's approval Conditions for the Project. According to the Project specific Condition, the ERP was due to be filed with the Board two months prior to the start of construction as part of Condition compliance. The Board reviewed the ERP from the perspective of this audit only, not for Condition compliance reasons. As this part of the audit process was completed very close to the Condition being filed, the Board is of the view that it addressed the requirements of the audit. The status of the Condition compliance assessment of the ERP can be reviewed on the NEB's public website through the use of the [Trans Mountain Interactive Conditions Tool](#).

### 3.12 Record Management

The Board verified through document review that records are to be kept in accordance with the requirements of the MPMP, which states: "*Records associated with the Major Projects Program are subject to the requirements of KM Records and Information Governance Policy and managed in accordance with the ILSMS Records Management Standard.*"

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### 3.13 Management of Change (MOC)

TMPU provided the Board with two MOC processes during the audit: one for TMPU's existing pipeline operations (Ops) and one specifically for the Project. The TMPU Ops MOC process covers all operational changes to pipelines and facilities. The Project MOC process is to be used for certain aspects of the Project.

According to the Project MOC document, *“the procedure shall be followed for any change to any aspect of the Trans Mountain Expansion Project. The MOC process applies irrespective of whether KMC, the Contractors, or subcontractors initiate the change, though the MOC process will be initiated and approved by KMC. Every change causing variation in cost, schedule or regulatory approval process will be controlled through this MOC process. The intent of the MOC process is to ensure input and consistent communication to the respective groups of changes that impact the Project.”*

The OPR MOC requirements do not include variations in cost or schedule. However the OPR requirements do include an MOC that can manage changes during construction such as design changes, regulatory changes, and procedural changes. The Board found this was not consistent with the requirements of the OPR as a company must have a single process applicable to the entire facility life cycle, not multiple processes.

### 3.14 Legal Requirements

A list of legal requirements as defined by the ISLMS Legal Requirements Standard is maintained by KMC Regulatory Services Team in a legal registry. The Board reviewed KMC's list of legal and other requirements and found it included much of the required content such as Conditions from Board Orders, Conditions specific to the Project approval, and Safety Advisories applicable to the Project. However review of the list indicated that the list did not include all referenced standards specifically included in the OPR.

## 4.0 Assessment of Compliance of the Audited Processes and Activities

### 4.1 General

In this section of the audit report the Board's assessment of compliance of the processes and activities reviewed as part of the audit will be made. To determine compliance, the Board evaluated TMPU's documents and records and conducted interviews with the Project personnel on issues relevant to the audit scope and criteria. The objective of the audit was to review and evaluate the state of establishment of processes and activities for the Project.

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The audit did not intend to test implementation of the various processes, programs, procedures and activities of the Project as it was still in the pre-construction stage at the time of the audit. Also, given that the audit only evaluated the establishment of pre-construction activities and processes (and not operational activities and processes), the definition of 'Established' in the attached list of Terminology and Definitions (Appendix 3) provides further guidance.

There are three possible assessments which were made as part of this pre-construction audit:

- Compliant (see attached list of definitions);
- Not-compliant (see attached list of definitions); and
- Not Assessed

Audit Protocol (AP) questions were assigned a numbering system from AP-TMPU-01 to AP-TMPU-37.

The Board identified a number of regulatory requirements that could not be assessed as either compliant or non-compliant during the audit. This was due to the fact that the Project had not yet progressed to the point where these protocol elements were required. The Board will be following up on all non-compliant and unable to assess protocol items through additional compliance verification activities outside of this audit.

There was also one protocol item that the Board did not assess in this audit and it will be the subject of a separate planned verification activity to be conducted by the Board.

#### **4.2 Assessed as Compliant**

The Board identified 11 compliant findings during the audit. For a more detailed assessment, refer to Appendix 1 as per the reference that follows each item.

- TMPU has authorized inspectors to halt construction at a specific construction site or specific construction activity if they encounter unsafe work practices or issues with the potential to cause harm to the environment. In addition, there are four senior members of the TMPU Project management team, who can halt construction along an entire construction spread or the entire Project at once if it is deemed necessary. (Refer to Appendix 1 Protocol Item AP-TMPU-07);
- TMPU's process for contractor selection (Refer to Appendix 1 Protocol Item AP-TMPU-09);

- TMPU's management review of the Project's performance measures, hazards, risk and incident investigation results and lessons learned (Refer to Appendix 1 Protocol Item AP-TMPU-15);
- TMPU's intended process to ensure that the construction contractors' hazard assessments, once created, are reviewed by the construction contractors on a regular basis and updated as required (Refer to Appendix 1 Protocol Item AP-TMPU-16);
- TMPU's intended process to ensure construction activities do not create a hazard to the public or environment (Refer to Appendix 1 Protocol Item AP-TMPU-18);
- TMPU's intended process to communicate corrective actions and learnings associated with incidents and incident investigations to ensure employees or persons working on behalf of the company are informed (Refer to Appendix 1 Protocol Item AP-TMPU-23);
- TMPU's intended process to communicate its emergency response practices and procedures to everyone who may be impacted by the construction activities (Refer to Appendix 1 Protocol Item AP-TMPU-27);
- TMPU's intended process to test its emergency response communication plan (Refer to Appendix 1 Protocol Item AP-TMPU-28);
- TMPU's intended activity to ensure alternative communication is available along the ROW where cell phone coverage is limited or intermittent (Refer to Protocol Item AP-TMPU-29);
- TMPU's intended process to ensure appropriate corrective and preventative actions are put in place and followed up on (Refer to Appendix 1 Protocol Item AP-TMPU-33); and
- TMPU's intended process to integrate compliance monitoring into the company's oversight model to ensure ongoing communication of requirements and resolution of non-compliances (Refer to Appendix 1 Protocol Item and 37).

### 4.3 Assessed as Non-Compliant

The Board identified 15 non-compliant (NC) findings during the audit. For a more detailed assessment, refer to Appendix 1 as per the reference that follows each item.

**NC Finding 1:** While the Project is using components of the TMPU management system, it was unable to demonstrate to the Board how the Project has been fully integrated into the their management system in a manner that meets the requirements of OPR s. 6.1 (Refer to Appendix 1 Protocol Item AP-TMPU-01);



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**NC Finding 2:** TMPU's policy for the internal reporting of hazards, potential hazards, incidents and near-misses does not meet the requirements of the OPR. TMPU's policy states that *"immunity from disciplinary action is granted for persons who in good faith internally report hazards, potential hazards, accidents and near misses"* The issue of concern is the term "good faith", which is not explicit as required by the OPR s. 6.3(1)(a) (Refer to Appendix 1 Protocol Item AP-TMPU-02);

**NC Finding 3:** TMPU has not created an organizational structure for the Project which meets the requirements of the OPR s. 6.4. In accordance with TMPU's MPMP Section 7.1.6, *"the project specific organizational structure and roles and responsibilities are to be established within a Project Execution Plan (PEP) or functional area sub-plan"*, neither of which were available at the time of the audit. (Refer to Appendix 1 Protocol Items AP-TMPU-03);

**NC Finding 4:** TMPU provided their operational hazard inventory which has some construction related hazards, but it is not specific to the Project. TMPU has not yet developed a process to identify and analyze all hazards and potential hazards related to the Project in accordance with the requirements of the OPR s. 6.5(1)(c) (Refer to Appendix 1 Protocol Item AP-TMPU-12);

**NC Finding 5:** TMPU provided their operational hazard inventory which has some construction related hazards, but it is not specific to the Project. TMPU has not developed an inventory of the hazards and potential hazards related to the Project in accordance with the requirements of the OPR s. 6.5(1)(d) (Refer to Appendix 1 Protocol Item AP-TMPU-13);

**NC Finding 6:** The Project management team requires the construction contractors to provide specific construction spread hazard inventories to the Project team, and the construction contractors were not selected at the time of the audit. The Project did have a high level Risk Register associated with the overall Project development, but it was not granular enough to show the individual risks associated with the construction activities. The risks associated with the identified hazards and potential hazards specific to the Project were not complete in accordance with the requirements of the OPR s. 6.5(1)(e) (Refer to Appendix 1 Protocol Item AP-TMPU-14);

**NC Finding 7:** The Project management team requires the construction contractors to provide specific construction spread hazard inventories to the Project team. However the construction contractors had not been selected at the time of the audit. TMPU did demonstrate that they had controls for their operational level hazard inventory, however it was not specific to the construction related activities for the Project. Therefore, the Project Management team have not yet developed and implemented controls associated with the identified hazards and potential hazards related to the Project in accordance with the requirements of the OPR s. 6.5(1)(f) (Refer to Appendix 1 Protocol Item AP-TMPU-17);





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**NC Finding 8:** TMPU provided the Board with two distinct MOC processes. One is used for existing and ongoing operational activities and one specifically for the Project. OPR s. 6.5(1)(i) indicates that a company shall have a single process, not multiple processes. Critical and important communication are to be communicated utilizing the Project MOC Process, however, the Project MOC process did not identify procedures for managing critical and important communications in accordance with the requirements of the OPR s. 6.5(1)(m) (Refer to Appendix 1 Protocol Items AP-TMPU-22);

**NC Finding 9:** TMPU has not yet developed a process to communicate all special Conditions associated with the Project; all special safety practices and procedures necessitated by the NEB Conditions specific to the construction; and inform the contractor of the contractor's responsibilities in a manner which meets the requirements of the OPR s. 6.5(1)(l) (Refer to Appendix 1 Protocol Item AP-TMPU-26);

**NC Finding 10:** TMPU has not yet developed an inspection and monitoring plan for the Project. In accordance with the requirements of MPMP and the CMP, each project is to develop a monitoring plan. Pre-construction work, which may involve physical activities, is still taking place on the Project regardless of whether or not a construction management and inspection contractor is in place. However, as of the date of the audit, TMPU had not yet established one in accordance with the requirements of the OPR s. 6.5(1)(u) (Refer to Appendix 1 Protocol Items AP-TMPU-30);

**NC Finding 11:** TMPU has not yet developed a process to ensure issues of concern found during monitoring activities are properly addressed in a timely manner in accordance with the requirements of the OPR s. 6.5(1)(u) (Refer to Appendix 1 Protocol Items AP-TMPU-31);

**NC Finding 12:** TMPU has not yet developed a process for handling deficiencies found during monitoring activities that require immediate attention in accordance with the requirements of the OPR s. 6.5(1)(u) (Refer to Appendix 1 Protocol Items AP-TMPU-32);

**NC Finding 13:** Through various activities, TMPU demonstrated that it had provided quality assurance for the purchase of several valve gates for the Project. TMPU also demonstrated that they had conducted quality assurance activities on potential pipe and coating suppliers. However, TMPU was found to be non-compliant for not following its own Quality Management Plan as per the requirements of the OPR s. 15. During the audit, the Board noted that the pipe manufacturing companies and the vendors to supply the raw material (plate material) shown in the Pipe Purchase Agreement are not listed in the Project's Approved Manufacturer's List. At this stage of the pre-construction, to not have the Lead of Quality Management position staffed is in the Board's view a concern as to how the overall Quality Management Program is fulfilling its responsibilities to the Project.



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In addition, the audit team noted that TMPU's Statement of Work for Vendor Quality Surveillance Services indicates that TMPU "*will not assume any responsibility for the conformance of the work to codes and regulations.*" The Board notes that the OPR's quality assurance requirements are clear in that it is the regulated company's responsibility to establish and implement the quality assurance program, not a third party vendor. Refer to Appendix 1 Protocol Items AP-TMPU-34);

**NC Finding 14:** TMPU provided two distinct MOC process, while the OPR requires a company to have one MOC process that applies to all aspects of the facility lifecycle. The Board could not determine how the Project specific MOC process and the operational MOC process will interact for changes that affect both TMPU ongoing operational activities and the Project itself. In addition, the Project MOC process does not describe how to manage any risk not specified by the process as presented including any new risk. (Refer to Appendix 1 Protocol Item AP-TMPU-35);

**NC Finding 15:** TMPU was found to be non-compliant for not having a legal list that included all referenced standards specifically included in the OPR. (Refer to Appendix 1 Protocol Item AP-TMPU-36).

#### 4.4 Not Assessed

The following protocol item was not assessed because it will be evaluated through a separate planned compliance verification activity outside of the audit:

**AP-TMPU-19:** Has the company established a security management program that anticipates, prevents, manages and mitigates conditions that could adversely affect people, property or the environment?

There were a number of other protocol items which were annotated as not assessed due to the fact that the Project had not yet progressed to the point where these protocol elements were required. The Board will monitor the implementation and effectiveness of these items through targeted compliance verification activities as a part of its on-going regulatory mandate.

## 5.0 Conclusion

In consideration of the findings of non-compliance, the Board concludes that, at the time of the audit, TMPU had not yet established all of the necessary oversight measures to manage construction-related safety and environmental protection for the construction Project.

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The Board noted that several processes, programs and activities were not fully established at the time of the audit. In several instances this resulted in the Board finding that TMPU was not in compliance with the requirements of the OPR. The Board found that there were non-compliances in the areas listed below, amongst others:

- Quality Assurance Program;
- Hazard analyses;
- Organizational structure and corresponding competency and training requirements;
- Definition of inspection and monitoring requirements;

The Board identified that TMPU was not following all aspects of its quality management plan. For example, at the time of the audit, TMPU had not yet staffed its Senior Quality Assurance Lead position, which is a requirement of the quality management plan. While the Board noted that TMPU had been undertaking quality assurance activities on key aspects of its facility components purchased or ordered to date, the Board is of the view that the staffing of the Senior Quality Assurance Lead position is key to consistent safety and environmental management and should have been staffed at this time in the Project.

At the time of the audit, TMPU had not yet identified and analyzed all potential hazards related to the construction project or developed the necessary controls. While TMPU did provide its operational hazard inventory, and the associated controls, these are not specific to the Project, and may not include all applicable hazards. The Board is of the view that this is an important step to ensure the safety of workers and the public and the protection of the environment. Following a management system approach, this step would lead to the development of other Project specific requirements such as determining the appropriate training and competencies of the workforce and the requirements of the monitoring and inspection program.

At the time of the audit, TMPU did not have a fully established organizational structure for the management and oversight of the Project with all corresponding competencies identified and training requirements developed. The Board noted that some aspects of the Project organizational structure had been established with their competencies and roles and responsibilities identified for TMPU staff. However, the construction management and inspection contractor had not been hired. The Board identified this contractor as one of the key methods of Project oversight and control for the Project. With the construction start date proposed for September of 2017, the Board will require a well-developed Corrective Action Plan (CAP) to demonstrate that this key level of Project oversight and control is well established and effective in its role.



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As the inspection and monitoring plan for the Project is to be developed by the construction management and inspection contractor, who had not been hired at the time of the audit, this plan was not yet fully developed. The Board will require a well-developed CAP to demonstrate that this management system requirement has been addressed and it has been effectively implemented by the Project.

Throughout the audit, the Board noted that TMPU had not integrated the Project into TMPU's overall management system in accordance with the requirements of Section 6 of the OPR. The OPR explicitly requires a company to have a management system that "*applies to all the company's activities involving the **design, construction, operation or abandonment of a pipeline and to the programs referred to in section 55***" (emphasis added). The Board did not see evidence to demonstrate that TMPU had integrated this Project into their existing management system. The Board did see that the Project was using pieces of TMPU's management system in an ad hoc approach.

In consideration of the findings of non-compliance, the Board directs TMPU to rectify all non-compliances associated with planned construction activities. All non-compliances must be rectified in accordance with a corrective action plan that will ensure the safety of workers and the public and environmental protection for all subsequent construction activities.

## **6.0 Corrective Action Plan Submission**

The Board acknowledges that TMPU has submitted a proposed CAP. The Board has reviewed and approved this CAP, with guidance and direction as noted in the covering letter of this audit report. TMPU is required to implement its CAP in accordance with the methods and timelines described in the CAP at Appendix VII of this report. The Board will review the deliverables as outlined by TMPU's CAP submission during implementation assessment meetings planned for the period August 28-30, 2017. Each finding will be considered resolved when all of the deficiencies as described in the report have been addressed in accordance with the legal requirements, the commitments and the actions described in the CAP. The Board will also continue to monitor the overall implementation and effectiveness of TMPU's management system and construction activities through targeted compliance verification activities as a part of its ongoing regulatory mandate.

The Board will post this Final Audit Report and the approved CAP on its website.

**Appendix I: Pre-Construction Audit – Audit Assessment Tables**

| <b>Topic: <u>Integration within the Management System</u></b>   |   |                    |  |
|---|---|--------------------|--|
| <b>Regulatory Requirement: OPR s. 6.1:</b> The company shall establish, implement and maintain a management system that (a) is systematic, explicit, comprehensive and proactive; (b) integrates the company’s operational activities and technical systems with its management of human and financial resources to meet its obligations under section 6; |   |                    |  |
| <b>Criteria Element 1:</b> The company is to have a management system that is systematic, explicit, comprehensive and proactive and integrates the company’s operational activities and technical systems with its management of human and financial resources to meet its obligations under section 6.   |   |                    |  |
| <b>Assessed Area:</b> The Process is Established  |   |                    |  |
| <i>Item Number</i>  | <i>Indicators of Compliance</i>   | <i>Assessment*</i> | <i>Assessment Notes</i>  |
| <b>AP-TMPU-01</b>   | Can the company demonstrate they have integrated the pipeline construction project’s safety and environmental protection considerations into their management system? | NC                 | <p>According to the Integrated Safety and Lost Management System, dated October 2016, “<i>The Vice President, Trans Mountain Expansion Project is responsible for the implementation of the ISLMS within the Trans Mountain Expansion Project.</i>” As stated in TMPU’s Major Projects Management Plan (MPMP) “<i>The Major Projects Program, is one of the management programs within the ISLMS.</i>” The Board noted that the MPMP document is dated 15 May 2017.</p> <p>The MPMP document states “<i>KMC is committed to the development, implementation, and maintenance of an Integrated Safety and Loss Management System (ISLMS) that addresses all aspects of the pipeline lifecycle to protect the safety and security of people, the environment and KMC’s business assets.</i>” The document goes on to say the following “<i>The Major Projects Management Program is responsible for the technical development, design, construction, and commissioning of a portfolio of growth related pipeline projects, facilities projects, and integrated projects that include both pipelines and facilities.</i>”</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|  |  |   |
|--|--|---|
|  |  | <p>The Board noted that this demonstrates how construction activities are to be integrated into the MPMP and as a result part of the TMPU management system.</p> <p>The MPMP document states “<i>(the Plan) is the governing document for the Major Projects Program. The Plan outlines the key components of the program and describes how the standards, procedures and practices that the program utilizes will be applied to comply with ISLMS requirements.</i>” The MPMP document explains how a major project would interact with existing ISLMS standards, procedures, frameworks and programs. Some examples of these from the MPMP document would include the following:</p> <ul style="list-style-type: none"> <li>• Hazard and Risk Management;</li> <li>• Legal Requirements;</li> <li>• Goals, Objectives, Targets, and Performance Measures; and</li> <li>• Training, Competency and Evaluation.</li> </ul> <p>The Board was informed during interviews that TMPU Intends to develop a Project Management Plan to incorporate management system elements into the Project. However this was not available at the time of the audit.</p> <p>While the Project is using pieces of the TMPU management system, such as the ISLMS Legal Requirements Standard, TMPU was unable to demonstrate to the Board how the Project has been fully integrated into the their management system in a manner that meets the requirements of OPR.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.1(a) and (b) at the time of the audit.</p> |
|--|--|---|

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

**Regulatory Requirement: OPR s. 6.3 (1):** The company shall establish documented policies and goals for meeting its obligations under section 6, including (a) a policy for the internal reporting of hazards, potential hazards, incidents and near-misses that includes the conditions under which a person who makes a report will be granted immunity from disciplinary action;

**Criteria Element 1:** The company is to have a policy in place during construction to allow for the internal reporting of hazards.

**Assessed Area:** The Process is Established

|                   |   |    |   |
|-------------------|---|----|---|
| <b>AP-TMPU-02</b> | Does the company have a policy for the internal reporting of hazards and has it been provided to its employees and contractors? | NC | <p>The Board was advised through interviews and verified through document review that TMPU intends to use and follow the KMC Safety and Loss Management Policy for the internal reporting of hazards, potential hazards, incidents and near-misses.</p> <p>However, this policy does not meet the requirements of the OPR. The KMC policy states that “<i>immunity from disciplinary action is granted for persons who in <u>good faith</u> internally report hazards, potential hazards, accidents and near misses</i>”. The issue of concern is the term “<i>good faith</i>”, which is not clearly understandable to workers as required by the OPR s. 6.3(1).</p> <p>The Board found TMPU to be non-compliant with the requirements of the OPR s. 6.3(1) at the time of the audit.</p> |
|-------------------|---|----|---|

**Topic: Organizational Structure, Roles and Responsibilities**

**Regulatory Requirement - OPR 6.4:** The company must have a documented organizational structure that enables it to: (a) meet the requirements of the management system and meet its obligations under section 6 (of the OPR); (b) determine and communicate the roles, responsibilities and authority of the officers and employees at all levels of the company;

**Additional applicable requirements:**

- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clauses 3.1.2 (b),(c)

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

**Criteria Element 1:** The company shall have a documented organizational structure that enables it to meet the requirements of the management system and meet its obligations under section 6 (of the OPR).

**Assessed Area:** The Process is Established

| <i>Item Number</i> | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>   |
|--------------------|--|--------------------|---|
| <b>AP-TMPU-03</b>  | Has the company created an organizational structure to provide effective oversight of the pipeline construction project and to meet the requirements of the management system and meet its obligations under section 6 (of the OPR)? | NC                 | <p>The Board found that TMPU has not yet created an org structure for the TMEX Project which meets the requirements of the OPR.</p> <p>In accordance with the KMC Major Projects Management Plan Section 7.1.6, “<i>the project specific organizational structure and roles and responsibilities are to be established within a Project Execution Plan (PEP) or functional area sub-plan</i>”, neither of which were available at the time of the audit.</p> <p>The Board found TMPU to be non-compliant with the requirements of the OPR s. 6.4 at the time of the audit.</p>  |
| <b>AP-TMPU-04</b>  | Has the company established a process to ensure field staff with authority on the construction spread is aware of legal requirements so they can take appropriate action if issues arise?  | NA                 | <p>The Board was unable to verify this due to the fact that TMPU stated that the development of the organizational structure for the construction management and inspection organization will be directed by Trans Mountain, in consultation with the construction management and inspection contractors and will include the determination of the required number and types of positions as well as the establishment of the roles, responsibilities and competencies for each position. This had not been completed at the time of the audit.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|                   |   |    |   |
|-------------------|---|----|---|
| <b>AP-TMPU-05</b> | Has the company established a process to manage multiple contractors over multiple construction spreads for both normal and abnormal construction conditions?   | NA | <p>The Board was unable to verify that the company has established a process to manage multiple contractors over multiple spreads. TMPU advised the Board that the development of the organizational structure for the construction management and inspection organization will be directed by Trans Mountain, in consultation with the construction management and inspection contractors and will include the determination of the required number and types of positions as well as the establishment of the roles, responsibilities and competencies for each position, but this had not been completed at the time of the audit. Until the organizational structure is created it will not be possible to assess the adequacy of the organization to manage multiple contractors over multiple construction spreads for both normal and abnormal conditions.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |
| <b>AP-TMPU-06</b> | Has the company established a process to ensure the workload and geographic area of responsibility assigned to employees and inspectors are manageable under normal operating conditions and a contingency plan established to deal with abnormal conditions? | NA | <p>The Board was unable to verify this due to the fact that TMPU advised the Board that the development of the organizational structure for the construction management and inspection organization will be directed by Trans Mountain, in consultation with the construction management and inspection contractors and will include the determination of the required number and types of positions as well as the establishment of the roles, responsibilities and competencies for each position.</p> <p>This had not been completed at the time of the audit. Until the organizational structure is created it will not be possible to assess if the workload and geographic area of responsibility assigned to employees and inspectors are manageable or if contingency plans are required.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p>   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)



**Regulatory Requirement - OPR 18(1)(d):** The company shall authorize a person to halt a construction activity in circumstances where, in the person's judgement, the construction activity is not being conducted in accordance with the manual developed under section 20 or is creating a hazard to anyone at the construction site.

**Criteria Element 1:** The company is to authorize a person to halt construction activity in circumstances where, in the person's judgement, the construction activity is not being conducted in accordance with the company's construction safety manual or is creating a hazard to anyone at the construction site.

**Assessed Area:** The Process is Established

| <i>Item Number</i> | <i>Indicators of Compliance</i>   | <i>Assessment*</i> | <i>Assessment Notes</i>   |
|--------------------|---|--------------------|---|
| <b>AP-TMPU-07</b>  | Has the company designated an authorized person to halt a construction activity in circumstances where, in the person's judgement, the construction activity is not being conducted in accordance with the company's construction safety manual or is creating a hazard to anyone at the construction site? | C                  | <p>The Board was advised that four senior people on the Project Management Team have been authorized to halt construction along an entire spread. The Board also noted in the Project HSMP Appendix A, Section 38 that it indicates that anyone has the authority to halt work on their particular section of pipeline if they encounter unsafe practices or issues with the potential to cause environmental harm.</p> <p>Based on the scope of the audit, the Board did not identify any issues of non-compliance for this item at the time of the audit.</p> |

**Topic: Competency, Training and Evaluation**

**Regulatory Requirement - OPR s. 6.5(1)(j):** establish and implement a process for developing competency requirements and training programs that provide employees and other persons working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment;

**Additional applicable requirements:**

- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clauses 3.1.2 (b),(c)
- Canada Labour Code Part II, Sections 124, 125. (1)(q),(z)

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

**Criteria Element 1:** The company shall establish competency requirements and training programs that provide employees and other persons working with or on behalf of the company with the training that will enable them to perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment

**Assessed Area:** The Process is Established.

| <i>Item Number</i> | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>  |
|--------------------|--|--------------------|--|
| <b>AP-TMPU-08</b>  | Has the company established an inventory of jobs, occupations, tasks and activities for the construction project and established a process that defines and aligns the required skills, knowledge and training for each? | NA                 | <p>The Board was informed during interviews and the Board verified through document review of the CEP that TMPU intends to rely on the construction management and inspection contractor to prepare an organizational structure to manage and oversee the work of the construction contractors. This will include defining the roles, responsibilities and competencies for the technical oversight positions, including inspectors and submit their proposed structure to the Project management team for review and approval. However the construction management and inspection contractor had not been hired at the time of the audit. Therefore, the organizational structure had not yet been developed for the Project and corresponding competencies, skills, knowledge and training requirements had not yet been determined.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |

**Regulatory Requirement - OPR s. 6.5(1)(k):** establish and implement a process for verifying that employees and other persons working with or on behalf of the company are trained and competent and for supervising them to ensure that they perform their duties in a manner that is safe, ensures the security of the pipeline and protects the environment.

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

| <b>Additional applicable requirements:</b> <ul style="list-style-type: none"> <li>- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clauses 3.1.2 (b),(c)</li> <li>- Canada Labour Code Part II, Sections 124, 125. (1)(s),(z)</li> </ul> |  |                    |  |
|---|--|--------------------|--|
| <b>Criteria Element 1:</b> The company shall verify employees and other persons working with or on behalf of the company are trained and competent.   |  |                    |  |
| <b>Assessed Area:</b> The Process is Established  |  |                    |  |
| <i>Item Number</i>  | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>  |
| <b>AP-TMPU-09</b>   | Has the company established a process for contractor selection to ensure they select and retain the services of contractors with safe practices? | C                  | The Board reviewed TMPU's Quality Management Plan, the TMEP Procurement Management Plan, and the Kinder Morgan Corporate Bidding Policy. The Board verified through document review that TMPU has a contractor selection process, which included an assessment of financial stability, capability of performing the work or supplying the materials, past performance, rating in ISNetWorld®, technical expertise, safety performance, and others. ISNetWorld® is a contractor management company that manages the safety compliance for many oil & gas companies globally. ISNetWorld® collects safety, procurement, quality and regulatory information from contractors and suppliers and verifies its accuracy and reports on its results. TMPU provided the Board with the RFP used to retain contractor services for work at the Edmonton Terminal as an example of the process. The document explained how TMPU reviewed contractor RFPs and the assessment matrix. Records associated with the process used to retain contractor services. Based on the scope of the audit, the Board did not identify any issues of non-compliance for this item at the time of the audit. |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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|-------------------|--|----|--|
| <b>AP-TMPU-10</b> | Has the company established a training program to ensure employees are aware of the identified hazards and controls and knowledgeable of the process to identify and report hazards and incidents? | NA | <p>The Board was advised during interviews that TMPU intends to provide orientation training to incorporate Project-related health and safety, security, environmental, indigenous and cultural training. Environment and safety training will have several different tiers of training, with the training becoming more focussed for supervisor and management positions. However, the training materials had not yet been completed at the time of the audit.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p>  |
| <b>AP-TMPU-11</b> | Has the company established a process to assess and evaluate worker competencies?  | NA | <p>TMPU informed the Board during interviews that it will be directly contracting the services of general construction contractors for the construction of the pipeline and facilities. Part of the general contractor competency evaluation process will be carried out using ISNetworld®. TMPU explained that the construction management and inspection contractor will play a role in evaluating the qualifications and competencies of the general construction contractors' personnel and inspection contractors brought on to the Project.</p> <p>The Board was advised during interviews and the Board verified through document review that the Project will be using the CCAP which is an existing set of processes for verifying that contractors conducting work on behalf of TMPU are qualified and competent to perform their duties. The CCAP establishes the systems and requirements to ensure that contractors conducting their work <i>“are qualified and perform their assigned tasks in a manner that is safe, ensures the security of the pipeline, and protects the environment”</i>. As part of the CCAP process, the initial qualification and competency verification begins when contractors provide documentation as specified in ISNetworld®.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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|  |  |  | <p>Once this stage has been successfully achieved, the Project team will apply the CCAP to the roles and positions identified by the construction management and inspection contractor, including construction contractors.</p> <p>The Board was advised that field verification checks will be carried out by a qualified Project representative to ensure the general construction contractors are demonstrating competent performance in the execution of their work.</p> <p>However, given that the construction management and inspection contractor had not been hired at the time of the audit, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |
|--|--|--|--|

**Topic: Hazard Identification, Risk Assessment and Control**

**Regulatory Requirement - OPR s. 6.5(1)(c):** establish and implement a process for identifying all hazards and potential hazards;

**Criteria Element 1:** The company shall establish and implement a process for identifying all hazards and potential hazards.

**Assessed Area:** The Process is Established

| <i>Item Number</i> | <i>Indicators of Compliance</i>   | <i>Assessment*</i> | <i>Assessment Notes</i>  |
|--------------------|---|--------------------|--|
| <b>AP-TMPU-12</b>  | Has the company identified hazards and potential hazards related to the TMEP pipeline construction project? | NC                 | The Board was provided with TMPU's 'Unified Hazard Listing and Risk Register for its existing operational facilities. However, these documents are not specific to the Project and don't contain Project specific hazards and risks. It was not deemed to be sufficiently detailed for construction related activities to meet the requirements of this protocol item. |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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|--|---|---------------------------|---|
|  |   |                           | <p>The Project management team advised the Board during interviews that they intend to provide the construction contractors with a basic list of hazards and direct each contractor to review and update the list with the specific hazards applicable to their construction spread. The Project management team will then combine the individual construction contractor lists into a Project-specific unified hazard inventory. However, at the time of the audit, this had not been completed.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(c) at the time of the audit.</p> |
| <p><b>Regulatory Requirement - OPR s. 6.5(1)(d):</b> establish and maintain an inventory of the identified hazards and potential hazards;</p>  |   |                           |   |
| <p><b>Criteria Element 1:</b> The company shall establish and maintain an inventory of hazards and potential hazards specific to the project.</p>  |   |                           |   |
| <p><b>Assessed Area:</b> The process is established.</p>   |   |                           |   |
| <b><i>Item Number</i></b>  | <b><i>Indicators of Compliance</i></b>  | <b><i>Assessment*</i></b> | <b><i>Assessment Notes</i></b>  |
| <b>AP-TMPU-13</b>  | Does the company have an inventory of hazards and potential hazards related to the pipeline construction project? | NC                        | <p>At the time of the audit TMPU had not yet developed an inventory of all hazards and potential hazards specific for the Project.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(d) at the time of the audit.</p>  |
| <p><b>Regulatory Requirement - OPR s. 6.5(1)(e):</b> establish and implement a process for evaluating and managing risks associated with the identified hazards including the risks related to normal and abnormal operating conditions;</p> |   |                           |   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

| <b>Additional applicable requirements:</b>   |   |                    |   |
|--|---|--------------------|---|
| - National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clauses 3.1.2 (f),(h)(vii)   |   |                    |   |
| <b>Criteria Element 1:</b> The company shall establish and implement a process for evaluating and managing risks associated with the identified hazards. |   |                    |   |
| <b>Assessed Area:</b> The Process is Established   |   |                    |   |
| <i>Item Number</i>   | <i>Indicators of Compliance</i>   | <i>Assessment*</i> | <i>Assessment Notes</i>   |
| <b>AP-TMPU-14</b>  | Has the company assessed the risks associated with the identified hazards?  | NC                 | <p>As noted in protocol question #12 above, TMPU does not yet have a compliant hazard inventory for the Project. Instead, the Board was provided with TMPU's 'Unified Hazard Listing and Risk Register' which included risk assessments for its existing operational activities, however these risk assessments were not done not specifically for the Project.</p> <p>The Board was also provided with a copy of the 'TMEP Project Internal Risk Register' which was used to evaluate the risks associated with the overall Project development but it was not granular enough to show the individual risks associated with the construction activities. At the time of the audit TMPU had not assessed the risks associated with the identified hazards and potential hazards related to the Project.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(e) at the time of the audit.</p> |
| <b>AP-TMPU-15</b>  | Has the company established a process for its construction activities where performance measures, hazards, risk and incident investigation results and lessons learned receive management review? | C                  | <p>TMPU provided the Board with the ISLMS Management Review Procedure document as the process that it intends to follow for the management review of Project. The Board reviewed the ISLMS Management Review Procedure and identified that it specifically identifies the VP TMEP as part of the Quality Assurance Management Review (QAMR) process, which in turn reports directly to the AO. The QAMR process includes a review of: goals, objectives and targets; data from hazard analysis and risk assessments; trends in</p>  |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|   |   |          |   |
|---|---|----------|---|
|   |   |          | <p>hazards, potential hazards, incidents and near-misses; lessons learned and corrective and preventative actions from incident investigations; results from audits and assessments; results from inspections and monitoring activities; year-end safety and loss management results and proposed performance measures and targets for the coming year; and others.</p> <p>Based on the scope of the Board did not identify any compliance issues for this item at the time of the audit.</p>   |
| <p><b>AP-TMPU-16</b></p>  | <p>Has the company established a process that ensures that hazard assessments are reviewed and updated as required when there is a change in work scope or work conditions such as changes in lighting, changes in crew members, temperature, or encroaching work activities?</p> | <p>C</p> | <p>The Board was advised during interviews and the Board verified through document review that TMPU will require contractors to carry out risk reviews on a regular basis in accordance with the requirements of Project HSMP which states, <i>“It is expected that Contractors will conduct their own, formal Risk Assessments to be used in conjunction with the following TMEP Risk Assessment to ensure that PSSP’s properly identify and plan for mitigation of the identified risks. Risk reviews must be completed on a regular basis by the Contractor.”</i></p> <p>The Project management team indicated to the Board that daily tailgate meetings will be used to update job hazard analysis as work scope or work conditions require it.</p> <p>Based on the scope of the Board did not identify any compliance issues with this requirement at the time of the audit.</p> |
| <p><b>Regulatory requirement – OPR s. 6.5(1)(f):</b> establish and implement a process for developing and implementing controls to prevent, manage and mitigate the identified hazards and the risks and for communicating those controls to anyone who is exposed to the risks;</p> <p><b>Additional applicable requirements:</b></p> <ul style="list-style-type: none"> <li>- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clause 3.1.2 (f)</li> </ul> |   |          |   |
| <p><b>Criteria Element 1:</b> The company has established a process to develop controls to prevent, manage and mitigate the identified hazards and the risks and for communicating those controls to anyone who is exposed to the risks.</p>  |   |          |   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)



| <b>Assessed Area:</b> Process is established.  |  |                    |   |
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| <i>Item Number</i>   | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>   |
| <b>AP-TMPU-17</b>  | Has the company established a process for developing and implementing controls to prevent, manage and mitigate the identified hazards and the risks? | NC                 | <p>The Project HSMP states, “A RA, indicating risks, their potential to occur and the potential consequences, for the TMEP can be found in Appendix B of this HSMP. Appendix B also contains the criteria used to construct the RA. The TMEP RA defines and rates the risks for the entire project in addition to identifying the actions required to control or mitigate the risks noted.” However, through document review the Board found that the HSMP Risk Assessment Process only provided several risks and controls, it was not reflective of the Project, and it does not include a process to develop controls.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(f) at the time of the audit.</p> |
| <p><b>Regulatory requirement: OPR s. 19:</b> A company shall, during the construction of a pipeline, take all reasonable steps to ensure that (a) the construction activities do not create a hazard to the public or the environment.</p> |  |                    |   |
| <p><b>Criteria Element 1:</b> The company is to take all reasonable steps to ensure the pipeline construction activities do not create a hazard to the public or the environment.</p>  |  |                    |   |
| <b>Assessed Area:</b> The Process is Established   |  |                    |   |
| <i>Item Number</i>   | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>   |
| <b>AP-TMPU-18</b>  | Has the company established a process to ensure construction activities do not create a hazard to the public or environment?                         | C                  | The Board noted that TMPU has developed a number of plans, manuals and programs to ensure construction activities do not create a hazard to the public or the environment. Some examples of these documents include: the Project HSMP; the various EPPs; the Navigation   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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|  |  |  | <p>and Safety Plan; the Access Management Plan; the Traffic and Access Control Management Plan and the Geotechnical Field Changes Manual.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p> |
|--|--|--|---|

**Regulatory Requirement: OPR s. 47.1:** A company shall develop, implement and maintain a security management program that anticipates, prevents, manages and mitigates conditions that could adversely affect people, property or the environment.

**Criteria Element 1:** The company is to have a security management program that anticipates, prevents, manages and mitigates conditions that could adversely affect people, property or the environment.

**Area Assessed:** The process is established.

| <i>Item Number</i> | <i>Indicators of Compliance</i>   | <i>Assessment*</i> | <i>Assessment Notes</i>  |
|--------------------|---|--------------------|--|
| <b>AP-TMPU-19</b>  | Has the company established a security management program that anticipates, prevents, manages and mitigates conditions that could adversely affect people, property or the environment? | NA                 | This protocol question will be assessed by other NEB compliance verification activities. |

**Topic: Communications**

**Regulatory Requirement - OPR s. 6.5(1)(m):** establish and implement a process for the internal and external communication of information related to safety, security and protection of the environment;

**Additional applicable requirements:**

- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clauses 3.1.2 (d),(g)(v)
- Canada Labour Code Part II, Sections 124, 125. (1)(q),(s),(w)

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

| <b>Criteria Element 1:</b> The company shall establish a process for the internal and external communication of information related to safety, security and protection of the environment. |  |                    |   |
|--|--|--------------------|---|
| <b>Assessed Area:</b> The Process is Established   |  |                    |   |
| <i>Item Number</i>   | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>   |
| <b>AP-TMPU-20</b>  | Has the company established a two-way communication process for information exchange between company management and employees, contractors and consultants, stakeholders and land managers and the NEB?  | NA                 | <p>The Board verified through document review that the process for communicating with regulators is provided in the Project Compliance Management Plan.</p> <p>TMPU informed the Board during interviews that it intends to develop a Project Internal Communication Plan based on the TMPU corporate ISLMS Internal Communication Standard. The Board was also advised that construction communication plans for communications between the Project management team and its contractors are under development. The Board was provided with a draft version of the Comprehensive Stakeholder Engagement and Communications Construction Execution Plan for communications with external stakeholders.</p> <p>Based on the scope of the audit, the Board was unable to assess this item as compliant or non-compliant as the communication plans were under development at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |
| <b>AP-TMPU-21</b>  | Has the company established a process to communicate roles, responsibilities and authorities for worker safety and environmental protection to officers and employees and employees at all levels of the company and to others working on behalf of the company? | NA                 | As discussed in protocol item AP-TMPU-20, TMPU informed the Board during interviews that it intends to develop a Project Internal Communication Plan based on the ISLMS Internal Communication Standard. The Board was also advised that construction communication plans for communications between the Project and its contractors are under development.   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|                          |   |           |   |
|--------------------------|---|-----------|---|
|                          |   |           | <p>TMPU informed the Board during interviews that the development of the organizational structure for the construction management and inspection organization will be directed by Trans Mountain, in consultation with the construction management and inspection contractors and will include the determination of the required number and types of positions as well as the establishment of the roles, responsibilities and competencies for each position.</p> <p>This will include defining roles, responsibilities and competencies for the various construction management and inspection positions and submit their proposed structure to the Project management team for review and approval. As the construction management and inspection contractor had not yet been hired, the organizational structure was not complete at the time of the audit.</p> <p>Until the organizational structure is fully developed it will not be possible to communicate roles, responsibilities and authorities for worker safety and environmental protection to officers and employees and employees at all levels of the company and to others working on behalf of the company.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |
| <p><b>AP-TMPU-22</b></p> | <p>Has the company established a process to communicate management-of-change related items such as changing regulatory requirements or the implementation of design changes or the implementation of corrective and preventive actions stemming from incident investigations?</p> | <p>NC</p> | <p>TMPU provided the Board with two distinct MOC processes. One is used for existing and ongoing operational activities and one specifically for the Project. The operational MOC process covers all existing operational changes to pipelines and facilities. OPR s. 6.5(1)(i) indicates that a company shall have a single process, not multiple processes.</p>   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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|                          |  |          | <p>As stated in the Project MOC document the “<i>procedure shall be followed for any change to any aspect of the Trans Mountain Expansion Project (the Project). The MOC process applies irrespective of whether KMC, the Contractors, or subcontractors initiate the change, though the MOC process will be initiated and approved by KMC. Every change causing variation in cost, schedule, or regulatory approval process will be controlled through this MOC process.</i>” The Board was advised that critical and important communication will be communicated utilizing the Project MOC Process, however, the Board’s review of the Project MOC process did not identify procedures for managing critical and important communications.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(i) at the time of the audit.</p>   |
| <p><b>AP-TMPU-23</b></p> | <p>Has the company established a process to communicate corrective actions and learnings to ensure employees or persons working on behalf of the company are informed?</p> | <p>C</p> | <p>The Board verified through document review that TMPU intends to use the ISLMS Incident Reporting and Investigation Standard for the Project. This document explains the process by which feedback will be provided to workers on the causes and preventive and corrective actions associated with incidents. In the section titled, Incident Investigation Feedback to Employees it states, “<i>Causes and corrective and preventative actions associated with incidents will be provided to affected workers as well as to other business units who may be similarly affected.</i>”</p> <p>A) <i>The KMC Incident Investigation Committee will create an Incident Corrective and Preventative Action Summary related to formal investigation to be communicated to all operational supervisors and affected areas biannually.</i></p> <p>B) <i>Each ISLMS Program will provide a summary of lessons learned as the result of investigations, as appropriate to all employees that could benefit from and apply this information to prevent similar incidents from occurring.</i>”</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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|   |   |    | <p>TMPU committed to the development of a Project Management Plan to integrate the Project into the ISLMS. With TMPU's commitment this standard will work for the Project. The Board is of the view that TMPU will meet its commitment and it will be creating a Project Management Plan specific to this Project.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p>  |
| <b>AP-TMPU-24</b>   | Has the company established a process to inform those who may have access to the construction site, but who are not involved in the construction of the pipeline of the practices and procedure that are to be followed for their safety?                                   | NA | <p>TMPU informed the Board during interviews that there will be a contractor site orientation training requirement for site visitors, and they be escorted while onsite. However, the training material for visitor orientation was under development at the time of the audit and could not be reviewed by the Board to verify the adequacy of the process.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p>                              |
| <b>AP-TMPU-25</b>   | Has the company established a process to make employees and others who work on behalf of the company aware of what constitutes a reportable incident to be reported internally and to the Board, and they have established a process to ensure these reports are submitted? | NA | <p>The Board noted that both the Project HSMP document and the EPPs state what is reportable to the Board. However, the training materials that will be used to communicate these requirements to all employees and others working on behalf of TMPU were under development at the time of the audit and could not be reviewed by the Board to verify what was in the training materials.</p> <p>Based on the scope of the audit and the Project stage, the Board was unable to assess this item as compliant or non-compliant at the time of the audit. The Board will monitor the implementation and effectiveness of this item through targeted compliance verification activities as a part of its on-going regulatory mandate.</p> |
| <p><b>Regulatory Requirement – OPR s. 18(1):</b> If the company contracts for the provision of services in respect of the construction of a pipeline, the company shall (a) inform the contractor of all special conditions associated with the construction; (b) inform the contractor of all special safety practices and procedures necessitated by the conditions or features specific to the construction; (b.1) inform the contractor of the contractor's responsibilities referred to in paragraph 6.5(1)(l) (of the OPR);</p> |   |    |   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

| <b>Additional applicable requirements:</b><br>- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clause 3.1.2 (d)  |  |                    |  |
|---|--|--------------------|--|
| <b>Criteria Element 1:</b> The company shall inform the contractor of all special conditions associated with the construction project; all special safety practices and procedures necessitated by the conditions or features specific to the construction; and inform the contractor of the contractor's responsibilities referred to in paragraph 6.5(1)(l) (of the OPR). |  |                    |  |
| <b>Assessed Area:</b> The Process is Established  |  |                    |  |
| <i>Item Number</i>  | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>  |
| <b>AP-TMPU-26</b>   | Has the company established a process to communicate all special conditions associated with the construction project; all special safety practices and procedures necessitated by the conditions or features specific to the construction; and inform the contractor of the contractor's responsibilities referred to in paragraph 6.5(1)(l) of the OPR? | NC                 | <p>The Board was advised during interviews that TMPU is in the process of developing various levels of training for workers that will be used to convey safety and environmental information. However, this was not provided to the Board at the time of the audit.</p> <p>The Board was advised during interviews that the RFPs associated with retaining the services of contractors will be another method used to relay information to the contractors to make them aware of special conditions associated with the Project. Specific requirements that the potential contractors will be responsible for are explained in the RFP documents so contractors are aware of what they will be required to do if they win the contract.</p> <p>The Board reviewed the Project Procurement Execution Plan and the Project RFP &amp; Contracts Award Procedure. The Board found that while the two documents indicated that bidding packages would be assembled for contractors to bid on, TMPU was unable to demonstrate that special conditions are communicated to potential contractors in these documents. Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(l) at the time of the audit.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

**Regulatory Requirement - OPR s. 34:** A company shall take all reasonable steps to inform all persons who may be associated with an emergency response activity on the pipeline of the practices and procedures to be followed and make available to them the relevant information that is consistent with that which is specified in the emergency procedures manual.

**Additional applicable requirements:**

- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clause 3.1.2 (d)
- Canada Labour Code Part II, Sections 124, 125(1)(q), 125(1)(s)

**Criteria Element 1:** The company shall establish a process for the internal and external communication of information related to emergency response activities specific to the pipeline construction project.

**Assessed Area:** The Process is Established

| <i>Item Number</i> | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>  |
|--------------------|--|--------------------|--|
| <b>AP-TMPU-27</b>  | Has the company established a process to communicate its emergency response practices and procedures to everyone who may be impacted by the construction activities? | C                  | <p>The Board noted that the TMPU draft Project specific Emergency Response Manual describes how emergency response procedures will be communicated to third party emergency responders and the TMPU Operations Team. It also describes how the construction contractors are to communicate their ERPs to adjacent contractors and advise them whenever there are changes.</p> <p>The draft ERP defines the minimum requirements which must be met by contractors in the development of site-specific ERPs (SSERPs), which are to be submitted to the Project management team for review and approval. The draft document details the division of responsibility between TMPU and contractors for various types of emergencies.</p> <p>The draft ERP requires contractors to ensure local authorities and other contractors working adjacent are provided with the SSERP.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)



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|--|--|---|
|  |  | <p><i>“Local Emergency Response authorities are to be engaged prior to the start of work to ensure effective coordination and communication with local fire, health and ambulance personnel and resources.”</i></p> <p><i>“Contractors are expected, prior to the start of work, to meet with relevant, local (Municipal, Regional, District, Provincial) Emergency Response Authorities. Information from these authorities, including procedures and communications protocols in the event of an emergency, must be considered in the Contractor’s development of their SSERP.”</i></p> <p><i>“Work maps will be made available to local emergency responders as required during a review of their SSERP with local first responders and health care officials.”</i></p> <p>The document requires contractors to communicate any changes to their SSERPs to other contractors and sub-contractors on their scope of the Project.</p> <p>According to the Project specific Condition, the ERP was due to be filed with the Board two months prior to the start of construction as part of Condition compliance. The Board reviewed the ERP from the perspective of this audit only, not for condition compliance reasons. As this part of the audit process was completed very close to the Condition being filed, the Board is of the view that it addressed the requirements of the audit.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p> |
|--|--|---|

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|                   |  |   |  |
|-------------------|--|---|--|
| <b>AP-TMPU-28</b> | Has the company established a process to test its emergency response communication plan?   | C | <p>The Board noted that in the draft ERP that TMPU indicated it will conduct emergency response drills including the ERP communications plan at least twice per year with no more than six months between drills.</p> <p>According to the Project specific Condition, the ERP was due to be filed with the Board two months prior to the start of construction as part of Condition compliance. The Board reviewed the ERP from the perspective of this audit only, not for condition compliance reasons. As this part of the audit process was completed very close to the Condition being filed, the Board is of the view that it addressed the requirements of the audit.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p> |
| <b>AP-TMPU-29</b> | Has the company identified all areas of the pipeline that may have limited or intermittent cell phone coverage, and has established a means to ensure alternate means of communication are made available? | C | <p>TMPU informed the Board during interviews that TMPU has identified several areas along the Project right of way where cell phone communications are of poor quality. TMPU informed the Board they will have satellite phones and two-way radios and other back-up communications alternatives in place. All contractors will be required to have alternative means of communication as well.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p>  |

**Topic: Inspection, Measurement and Monitoring**

**Regulatory Requirement - OPR s. 6.5(1)(u):** establish and implement a process for inspecting and monitoring the company's activities and facilities to evaluate the adequacy and effectiveness of the programs referred to in section 55 (of the OPR), and for taking corrective and preventive actions if deficiencies are identified;

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

**Additional applicable requirements:**

- OPR 6.5(1)(p): establish and implement a process for generating, retaining and maintaining records that document the implementation of the management system and the programs referred to in section 55 (of the OPR) and for providing access to those who require them in the course of their duties;
- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clauses 3.1.2 (h)(iv),(v),(vi);
- Canada Labour Code Part II, Sections 124, 125(1)(t)

**Criteria Element 1:** The company is to have a process for inspecting and monitoring the company’s activities and facilities to evaluate the adequacy and effectiveness of the programs referred to in section 55 (of the OPR), and for taking corrective and preventive actions if deficiencies are identified

**Assessed Area:** The Process is Established

| <i>Item Number</i> | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>  |
|--------------------|--|--------------------|--|
| <b>AP-TMPU-30</b>  | Has the company identified what monitoring activities are to be carried out; the method and frequency; and the records to be kept? | NC                 | <p>The Board was informed during interviews and the Board verified through document review that TMPU would be relying on the construction management and inspection contractor to determine monitoring requirements, but as of the date of the audit, the services of the construction management and inspection contractor had not yet been retained. In accordance with the requirements of the MPMP, “<i>Each project or applicable functional area within a project will develop and update periodically, as necessary, a Monitoring Plan, which outlines the rationale, timing, frequency, and accompanying methodology for the execution of monitoring activities performed by the project or functional area.</i>”</p> <p>The Board is concerned that at this stage of the Project there is no process to identify what monitoring activities are to be carried out and at what frequency. Pre-construction Project work, that may involve physical activities, is still taking place regardless of whether or not a construction management and inspection contractor is in place.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|                   |   |    |  |
|-------------------|---|----|--|
|                   |   |    | <p>The Board verified through document review that records are to be kept in accordance with the requirements of the MPMP which states that major projects are to follow the ISLMS records management standard. Based on the scope of the audit, the Board did not identify any compliance issues with this part of the protocol requirement. Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(u) at the time of the audit.</p>   |
| <b>AP-TMPU-31</b> | Has the company established a process to ensure issues of concern found during monitoring activities are properly addressed in a timely manner? | NC | <p>The Board was informed during interviews and the Board verified through document review that TMPU would be relying on the services of the construction management and inspection contractor to determine monitoring requirements for the Project. However, at the time of the audit the services of the construction management and inspection contractor had not yet been retained. Therefore, at the time of the audit, TMPU had not yet developed a process to ensure issues of concern found during monitoring activities are properly addressed in a timely manner.</p> <p>The Board is concerned that at this stage of the Project there is no process to ensure that issues of concern are quickly and appropriately addressed. Pre-construction work, which may involve physical activities, is still taking place on the Project regardless of whether or not a construction management and inspection contractor is in place.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(u) at the time of the audit.</p> |
| <b>AP-TMPU-32</b> | Has the company established a process for handling deficiencies found during monitoring activities that require immediate attention?            | NC | <p>The Board was informed during interviews and the Board verified through document review that TMPU would be relying on the services of the construction management and inspection contractor to determine monitoring requirements for the Project. The Board would expect the monitoring plan to include the process for addressing deficiencies found during monitoring activities that require immediate attention. At the time of the audit TMPU had not yet developed a process for addressing deficiencies found during monitoring activities that require immediate attention.</p>   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|   |   |          |   |
|---|---|----------|---|
|   |   |          | <p>The Board is concerned that at this stage of the Project there is no process to ensure that deficiencies identified during monitoring activities that require immediate attention can be corrected immediately. Pre-construction work is still taking place on the Project regardless of whether or not a construction management and inspection contractor is in place. Based on the scope of the audit, the Board found TPU to be non-compliant with the requirement of the OPR s. 6.5(1)(u) at the time of the audit.</p>   |
| <p><b>AP-TMPU-33</b></p>  | <p>Has the company established a process to ensure appropriate corrective and preventative actions are put in place and followed up on?</p> | <p>C</p> | <p>The Board was provided and reviewed the Project Compliance Management Plan sections on: Non-Compliance Correction; Continuous Improvement; and Non-Compliance Tracking and Documenting. These sections describe how the Project management team will rectify non-compliances found during inspection and monitoring activities. The Board was informed during interviews and the Board verified through document review that the responsibility for ensuring corrective and preventive actions stemming from issues found during inspections are implemented will be the responsibility of the Project management teams, TPU's, Senior Inspectors.</p> <p>While the Board found TPU non-compliant for the lack of a monitoring plan, the Board found that the Project does have a documented process for ensuring appropriate corrective and preventive actions are put in place and followed up on.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p> |
| <p><b>Regulatory Requirement - OPR s. 6.5(1)(g):</b> A company shall, as part of its management system and the programs referred to in section 55, establish and implement a process for identifying, and monitoring compliance with, all legal requirements that are applicable to the company in matters of safety, security and protection of the environment.</p> |   |          |   |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

**Additional applicable requirements:**

- OPR 15: A company shall develop a quality assurance program for the purpose of ensuring that the pipe and component to be used in the pipeline meet the specifications referred to in section 14;
- National Energy Board Safety Advisory NEB SA 2016-01 - Pipeline Fittings Material Quality Assurance;
- National Energy Board Safety Advisory NEB SA 2016-01A – Pipeline Fittings Material Quality Assurance.

**Criteria Element 1:** The company is to have a process for identifying and monitoring compliance with all legal requirements including referenced standards, Board orders and Board conditions.

**Assessed Area:** The Process is Established

| <i>Item Number</i> | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>  |
|--------------------|--|--------------------|--|
| <b>AP-TMPU-34</b>  | <p>Has the company established a process to monitor construction activities for compliance to all legal requirements and applicable Board orders and conditions including the Board’s Safety Advisory NEB SA 2016-01 and NEB 2016-01A?</p> | NC                 | <p>The ISLMS Legal Requirements Standard is maintained by KMC Regulatory Services Team in a legal registry. The Board observed that TMPU has a list of legal and other requirements Conditions from Board Orders, Conditions specific to the Project approval, and Safety Advisories applicable to the Project, but did not include other applicable legal requirements such as referenced standards specifically included in the OPR.</p> <p>The Board noted that the Project’s Chief Quality Lead position had not been staffed even though the Project is near the end of the pre-construction phase of work. In accordance with the Project’s Quality Management Plan, purchase order documents are to be reviewed by the VP TMEP, the Engineering Design Manager, Director of Quality and relevant SMEs. The Board noted that TMPU has purchased equipment and material for the Project without having the Senior Quality Assurance position staffed.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

|  |  |  |
|--|--|--|
|  |  | <p>Regardless of the lack of staffing of the Chief Quality Lead, it was noted that required quality assurance activities were still being completed on an as needed basis. The Board verified through document review that TMPU had retained the services of a third-party engineering consultant witnessed and documented vendor equipment tests for four gate valves already purchased for the Project.</p> <p>In addition, the Board was informed during interviews that TMPU had also retained the services of a third-party engineering firm to evaluate pipe manufacturing facilities and pipe coating facilities as a pre-construction activity and that TMPU had sent a representative to the pipe manufacturing and pipe coating facilities to conduct safety inspections. This process was verified by the Board through document review.</p> <p>An additional issue relating to quality assurance was also noted during the audit. The Board noted that the pipe manufacturing companies and the vendors supplying the raw material (plate material) listed in the Pipe Purchase Agreement Contract are not listed in the Project's Approved Manufacturer's List, even though it is a requirement of the Project's Quality Management Plan.</p> <p>It was noted that TMPU's Statement of Work for Vendor Quality Surveillance Services indicates that TMPU "<i>will not assume any responsibility for the conformance of the work to codes and regulations.</i>" The Board notes that the OPR's quality assurance requirements are clear in that it is the regulated company's responsibility to establish and implement the quality assurance program, not a third party vendor.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 15 and s. 6.5(1)(g) at the time of the audit.</p> |
|  |  |  |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

| <b>Topic: <u>Management of Change</u></b>  |  |                    |   |
|--|--|--------------------|---|
| <p><b>Regulatory Requirement – OPR s. 6.5(1)(i):</b> establish and implement a process for identifying and managing any change that could affect safety, security or the protection of the environment including any new hazard or risk, any change in design, specification, standard or procedure and any change in the company’s organizational structure or the legal requirements applicable to the company;</p> <p><b>Additional applicable requirements:</b></p> <ul style="list-style-type: none"> <li>- National Standard of Canada, CAN/CSA-Z662-15, Oil and gas pipeline systems, Clause 3.1.2 (g)</li> </ul> |  |                    |   |
| <p><b>Criteria Element 1:</b> The company is to have a process to identify and manage any change that could affect safety, security or the protection of the environment including any new hazard or risk, any change in design, specification, standard or procedure and any change in the company’s organizational structure or the legal requirements applicable to the company.</p>  |  |                    |   |
| <p><b>Assessed Area:</b> The process is established.</p>   |  |                    |   |
| <i>Item Number</i>   | <i>Indicators of Compliance</i>  | <i>Assessment*</i> | <i>Assessment Notes</i>   |
| <b>AP-TMPU-35</b>  | Has the company established a process to manage changes that occur during the pipeline construction project including design changes, regulatory changes and procedural changes? | NC                 | <p>TMPU provided the Board with two distinct MOC processes. One is used for existing and ongoing operational activities and one specifically for the Project. OPR s. 6.5(1)(i) indicates that a company shall have a single process, not multiple processes.</p> <p>The operational MOC process covers all operational changes to pipelines and facilities. As stated in the Project specific MOC document the “<i>procedure shall be followed for any change to any aspect of the Trans Mountain Expansion Project (the Project).</i>”</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)



|  |  |   |
|--|--|---|
|  |  | <p><i>The MOC process applies irrespective of whether KMC, the Contractors, or subcontractors initiate the change, though the MOC process will be initiated and approved by KMC. Every change causing variation in cost, schedule, or regulatory approval process will be controlled through this MOC process.</i>” The OPR MOC requirements do not include variations in cost or schedule. However the OPR requirements do include an MOC that can manage changes during construction such as design changes, regulatory changes, and procedural changes. The Project specific MOC does not meet this requirement.</p> <p>The Board could not determine how the Project specific MOC process and the operational MOC process will interact for changes that affect both TMPU ongoing operational activities and the Project itself. In addition, the Project MOC process does not describe how to manage any risk not specified by the process including any new risk, which is a requirement of OPR s. 6.5(1)(i).</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1)(i) at the time of the audit.</p> |
|--|--|---|

**Topic: Legal Requirements**

**Regulatory Requirement: OPR s. 6.5(1)(g):** establish and implement a process for identifying and monitoring compliance with, all legal requirements that are applicable to the company in matters of safety, security and protection of the environment; (h) establish and maintain a list of those legal requirements.

**Criteria Element 1:** The company is to have a process to identify and monitor legal requirements that relate to the project and have a list of those legal requirements including conditions for the project and have a process in place to demonstrate ongoing compliance.

**Area Assessed:** The process is established.

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

| <i>Item Number</i> | <i>Indicators of Compliance</i>   | <i>Assessment*</i> | <i>Assessment Notes</i>   |
|--------------------|---|--------------------|---|
| <b>AP-TMPU-36</b>  | Does the company have a concordance table or alternative in place to ensure it has incorporated compliance monitoring into how it oversees the project? | NC                 | <p>The Board verified through document review that a list of legal requirements as defined by the ISLMS Legal Requirements Standard is maintained by KMC Regulatory Services Team in a legal registry. The Board reviewed KMC's list of legal and other requirements and found it included Legal Requirements, Conditions from Board Orders, Conditions specific to the Project approval, and Safety Advisories applicable to the Project. However, the legal list did not include all other applicable legal requirements such as referenced standards specifically included in the OPR.</p> <p>Based on the scope of the audit, the Board found TMPU to be non-compliant with the requirement of the OPR s. 6.5(1) (h) at the time of the audit.</p>                              |
| <b>AP-TMPU-37</b>  | Has compliance monitoring been integrated into the oversight model to ensure ongoing communication of requirements and resolution of non-compliances?   | C                  | <p>TMPU provided its Project Compliance Management Plan to explain how compliance monitoring and issue resolution are to be integrated into the Project oversight. As per this document, the Project's senior Compliance Advisor has been assigned the responsibility to ensure there is ongoing communication of requirements and resolution of non-compliances.</p> <p>The Compliance Management Plan describes how non-compliances will be identified, reported and corrected. It does show how they will be tracked, documented and how compliance advisories will be used to communicate requirements and resolution of non-compliances.</p> <p>Based on the scope of the audit, the Board did not identify any compliance issues with this item at the time of the audit.</p> |

\*Assessment Key: Compliant (C); Non-compliant (NC); Not Assessed (NA)

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## Appendix II – Audit Process Overview

### NEB Purpose and Audit Framework

The NEB's purpose is to promote safety and security, environmental protection, and efficient energy infrastructure and markets in the Canadian public interest within the mandate set by Parliament in the regulation of pipelines, energy development and trade. In order to assure that pipelines are designed, constructed, operated and abandoned in a manner that ensures: the safety and security of the public and the company's employees; safety of the pipeline and property; and protection of the environment, the Board has developed regulations requiring companies to establish and implement documented management systems applicable to specified technical management and protection programs. These management systems and programs must take into consideration all applicable requirements of the NEB Act and its associated regulations. The applicable Legislation and Regulations which come under the NEB's mandate, responsibilities and powers include:

- *National Energy Board Act* and associated regulations;
- *Canada Oil and Gas Operations Act* and associated regulations;
- *Canada Petroleum Resources Act* (sections 28 and 35) and associated regulations;
- *Oil and Gas Operations Act* and associated regulations; and
- *Petroleum Resources Act* and associated regulations.

Additional regulatory requirements are contained within:

- The *Canada Labour Code, Part II*, and the *Canada Occupational Health and Safety Regulations*; and
- Any conditions contained within applicable certificates or orders issued by the Board.

To evaluate compliance with its regulations, the Board audits the management system and programs of regulated companies. The Board requires each regulated company to demonstrate that they have established and implemented, adequate and effective methods for proactively identifying and managing hazards and risks. The Board's management system requirements are described within the *National Energy Board Onshore Pipeline Regulations (OPR)* sections 6.1 through 6.6.



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## Background

The NEB expects pipeline companies to operate in a systematic, comprehensive and proactive manner that manages risks. The Board expects companies to have effective, fully developed and implemented management systems and protection programs that provide for continual improvement.

As required by the OPR, companies must establish, implement and maintain effective management systems and protection programs in order to anticipate, prevent, mitigate and manage conditions that may adversely affect the safety and security of the company's pipelines, employees, the general public, as well as the protection of property and the environment.

During the audit, the Board reviews documentation and samples records provided by the company in its demonstration of compliance and interviews corporate and regionally based staff. The Board also conducts separate but linked technical inspections of a representative sample of company facilities. This enables the Board to evaluate the adequacy, effectiveness and implementation of the management system and programs. The Board bases the scope and location of the inspections on the needs of the audit. The inspections follow the Board's standard inspection processes and practices. Although they inform the audit, inspections are considered independent of the audit. If unsafe or non-compliant activities are identified during an inspection, they are actioned as set out by the Board's standard inspection and enforcement practices.

After completing its field activities, the Board develops and issues a Final Audit Report. The Final Audit Report outlines the Board's audit activities and provides evaluations of the company's compliance with the applicable regulatory requirements. Once the Board issues the Final Audit Report, the company must submit and implement a Corrective Action Plan to address all non-compliances identified. Final Audit Reports are published on the Board's website. The audit results are integrated into NEB's risk-informed lifecycle approach to compliance assurance.

## Audit Objectives and Scope

This audit evaluated the company against the legal requirements and scope outlined in the main body of the audit report.

## Audit Activities

On 12 April 2017, the Board informed Trans Mountain Pipeline ULC of its intent to audit the Trans Mountain Expansion Project from a pre-construction point of view. Board staff then provided TMPU with an overview of the NEB audit process, the audit criteria, a request for documentation and a list of questions to answer relevant to the objectives and scope of the audit. The NEB conducted its assessment based on the responses provided by the company and the evidence gathered during the audit.

Board staff was in contact with company staff on a regular basis to arrange and coordinate this audit. TMPU established a digital access portal for Board staff to review documentation and records.

On 16 May 2017, Board Staff conducted an opening meeting with company representatives in Calgary to confirm the Board's audit objectives, scope and process. Subsequent to the opening meeting, interviews were held at the company's office in Calgary during the period 29 May to 2 June 2017. Throughout the audit, Board audit staff provided company representatives with daily summaries with action items, where required.

On 9 June 2017, the Board held an audit pre close-out meeting with company representatives. At this meeting, Board staff and TMPU staff discussed potential non-compliances identified during the audit. At that time the company was provided with the opportunity to present additional evidence to rectify these potential non-compliances.

On 14 June 2017, the Board held a final close-out meeting with company representatives to present the Board's final assessment of findings noted during the audit.



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## Appendix III – Terminology and Definitions

*(The Board has applied the following definitions and explanations in measuring the various requirements included in this audit. They follow or incorporate legislated definitions or guidance and practices established by the Board, where available.)*

**Adequate:** The management system, programs or processes complies with the scope, documentation requirements and, where applicable, the stated goals and outcomes of the NEB Act, its associated regulations and referenced standards. Within the Board's regulatory requirements, this is demonstrated through documentation.

**Audit:** A systematic, documented verification process of objectively obtaining and evaluating evidence to determine whether specified activities, events, conditions management systems or information about these matters conform to audit criteria and legal requirements and communicating the results of the process to the company.

**Compliant:** The company has demonstrated that it has developed and implemented programs, processes and procedures that meet legal requirements.

**Corrective Action Plan:** A plan that addresses the non-compliances identified in the audit report and explains the methods and actions that will be used to correct them.

**Developed:** A process or other requirement has been created in the format required and meets the described regulatory requirements.

**Effective:** A process or other requirement meets its stated goals, objectives, targets and regulated outcomes. Continual improvement is being demonstrated. Within the Board's regulatory requirements, this is primarily demonstrated by records of inspection, measurement, monitoring, investigation, quality assurance, audit and management review processes as outlined in the OPR.

**Established:** A process or other requirement has been developed in the format required. It has been approved and endorsed for use by the appropriate management authority and communicated throughout the organization. All staff and persons working on behalf of the company or others that may require knowledge of the requirement are aware of the process requirements and its application.

**Finding:** The evaluation or determination of the compliance of programs or elements in meeting the requirements of the *National Energy Board Act* and its associated regulations.



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**Implemented:** A process or other requirement has been approved and endorsed for use by the appropriate management authority. It has been communicated throughout the organization. All staff and persons working on behalf of the company or others that may require knowledge of the requirement are aware of the process requirements and its application. Staff has been trained on how to use the process or other requirement. Staff and others working on behalf of the company have demonstrated use of the process or other requirement. Records and interviews have provided evidence of full implementation of the requirement, as prescribed (i. e. the process or procedures are not partially utilized).

**Inventory:** A documented compilation of required items. It must be kept in a manner that allows it to be integrated into the management system and management system processes without further definition or analysis.

**List:** A documented compilation of required items. It must be kept in a manner that allows it to be integrated into the management system and management system processes without further definition or analysis.

**Maintained:** A process or other requirement has been kept current in the format required and continues to meet regulatory requirements. With documents, the company must demonstrate that it meets the document management requirements in OPR, section 6.5(1)(o). With records, the company must demonstrate that it meets the records management requirements in OPR, section 6.5 (1)(p).

**Management System:** The system set out in OPR sections 6.1 to 6.6. It is a systematic approach designed to effectively manage hazards and reduce risk, and promote continual improvement. The system includes the organizational structures, resources, accountabilities, policies, processes and procedures required for the organization to meet its obligations related to safety, security and environmental protection.

*(The Board has applied the following interpretation of the OPR for evaluating compliance of management systems applicable to its regulated facilities.)*

*As noted above, the NEB management system requirements are set out in OPR sections 6.1 to 6.6. Therefore, in evaluating a company's management system, the Board considers more than the specific requirements of section 6.1. It considers how well the company has developed, incorporated and implemented the policies and goals on which it must base its management system as described in section 6.3; its organizational structure as described in section 6. 4; and considers the establishment, implementation, development and/or maintenance of the processes, inventory and list described in section 6.5(1). As stated in sections 6.1(c) and (d), the company's management system and processes must apply and be applied to the programs described in section 55.*





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**Non-Compliant:** The company has not demonstrated that it has developed and implemented programs, processes and procedures that meet the legal requirements. A corrective action plan must be developed and implemented.

**Procedure:** A documented series of steps followed in a regular and defined order thereby allowing individual activities to be completed in an effective and safe manner. A procedure also outlines the roles, responsibilities and authorities required for completing each step.

**Process:** A documented series of actions that take place in an established order and are directed toward a specific result. A process also outlines the roles, responsibilities and authorities involved in the actions. A process may contain a set of procedures, if required.

*(The Board has applied the following interpretation of the OPR for evaluating compliance of management system processes applicable to its regulated facilities.)*

*OPR section 6.5(1) describes the Board's required management system processes. In evaluating a company's management system processes, the Board considers whether each process or requirement: has been established, implemented, developed or maintained as described within each section; whether the process is documented; and whether the process is designed to address the requirements of the process, for example a process for identifying and analyzing all hazards and potential hazards. Processes must contain explicit required actions including roles, responsibilities and authorities for staff establishing, managing and implementing the processes. The Board considers this to constitute a common 5 w's and h approach (who, what, where, when, why and how). The Board recognizes that the OPR processes have multiple requirements; companies may therefore establish and implement multiple processes, as long as they are designed to meet the legal requirements and integrate any processes linkages contemplated by the OPR section. Processes must incorporate or contain linkage to procedures, where required to meet the process requirements.*

*As the processes constitute part of the management system, the required processes must be developed in a manner that allows them to function as part of the system. The required management system is described in OPR section 6.1. The processes must be designed in a manner that contributes to the company following its policies and goals established and required by section 6.3.*

*Further, OPR section 6.5(1) indicates that each process must be part of the management system and the programs referred to in OPR section 55. Therefore, to be compliant, the process must also be designed in a manner which considers the specific technical requirements associated with each program and is applied to and meets the process requirements within each program. The Board recognizes that single process may not meet all of the programs; in these cases it is acceptable to establish governance processes as long as they meet the process requirements (as described above) and direct the program processes to be established and implemented in a consistent manner that allows for the management system to function as described in 6.1.*





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**Program:** A documented set of processes and procedures designed to regularly accomplish a result. A program outlines how plans, processes and procedures are linked; in other words, how each one contributes to the result. A company regularly plans and evaluates its program to check that the program is achieving the intended results.

*(The Board has applied the following interpretation of the OPR for evaluating compliance of programs required by the NEB regulations.)*

*The program must include details on the activities to be completed including what, by whom, when, and how. The program must also include the resources required to complete the activities.*

## Appendix IV - Abbreviations

AO: Accountable officer

AP: Audit Protocol

CAP: Corrective Action Plan

CAPA: Corrective Action / Preventive Action

CCAP: Contractor Competency Assurance Plan

CCMP: Contractor Compliance Management Plan

CEP: Construction Execution Plan

CLC: *Canada Labour Code, Part II*

CMP : Compliance Management Plan

CMSTQ : Canada (Oil and Gas) Midstream Training Qualification

COHSR: *Canada Occupational Health and Safety Regulations*

CQS: Contractor Qualification Specification

CSA Z662-15: CSA Standard Z662 entitled *Oil and Gas Pipeline Systems*, 2015 version

EHS: Environment, health and safety

EPASS: Environmental Performance and Safety System

EPP: Environmental Protection Plan

ERP: Emergency Response Plan

HSMP: Health and Safety Management Plan

ISLMS: Integrated Safety Loss Management System

KMC: Kinder Morgan Canada Inc.

MOC: Management of change

MPMP: Major Project Management Plan

NEB: National Energy Board

OPR: *National Energy Board Onshore Pipeline Regulations*

Ops: Operations

PEP: Project Execution Plan

PSSP: Project Specific Safety Plan

QMP: Quality Management Plan

SE&C: Stakeholder Engagement and Communications

SME: Subject Matter Expert

TMEP: Trans Mountain Expansion Project

TMPU: Trans Mountain Pipeline ULC

VP TMEP: Vice President Trans Mountain Expansion Project

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## Appendix V: Documents and Records Reviewed

The following documents were reviewed as part of the TMPU Pre-construction audit:

- Kinder Morgan Code of Business Conduct and Ethics (Effective 01/01/2000) (Revised (01/20/2016))
- 3.2 Hazard Identification and Reporting Procedure, Revision 0, Effective January 31 2017
- 3.1 Hazard and Risk Management Standard, Revision 1, Dated August 25, 2016
- 2.1 Integrated Safety and Loss Management System, Revision 3, Dated October 12, 2016
- KMC ISLMS Awareness Training Skill Packet Final, undated
- Health and Safety Management Plan for the Trans Mountain Pipeline ULC Trans Mountain Expansion Project, May 2017, 01-13283-GG-0000-HS-PLN-001
- Trans Mountain Expansion Project, Field Changes Manual for Geohazards Mitigation, NEB Condition 51, May 1, 2017
- Appendix C – Contractor Environmental Management Plan Table of Contents
- Trans Mountain Contract for The Engineering, Procurement and Construction of Spreads 1 through 6, Trans Mountain Expansion Project, Attachment C-3 Environmental Requirements, Exhibit C – Owner’s Requirements, Rev 0 (April 7/17)
- TMEP Organizational Structure, 16 May 2017, Rev A
- Trans Mountain Expansion Project Project Charter, Document # 01-13281-RPT-PM-0019, signed and dated 10 Apr 2017
- Trans Mountain Expansion Project Emergency Management Program Attachment A Incident Communication Procedure (NEB Condition 89), dated January 13, 2017 DRAFT R01
- Trans Mountain Expansion Project Emergency Response Plan (ERP) (NEB Condition 89), May 8, 2017 DRAFT R02
- Trans Mountain Expansion Project, Traffic and Access Control Management Plan, 681657/March 2017



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- Trans Mountain Expansion Project, Traffic and Access Control Management Plan, 681657/March 2017, Appendix A – Construction Access Management Maps, Road Crossings, Access Roads and Access Points
  - Kinder Morgan Contractor Qualification Specification, CQS-CP003 Contract Project Manager, Revision: February 20, 2017
  - Kinder Morgan Contractor Qualification Specification, CQS-CP002 Facility Construction Inspector, Revision: December 15, 2016
  - Kinder Morgan Training Record Signoff Form, Conduct Hazard Assessment, Revision: February 10, 2016
  - Kinder Morgan, Conduct Hazard Assessment Skill Packet, Revision: February 10, 2016 says trainees must meet the standard, but does not provide the standard to the evaluator. The Hazard Assessment trainee evaluation appears to be only for KM employees. What about contracted personnel?
  - Kinder Morgan 4.1 Contractor Competency Assurance Plan, Revision 0, January 8, 2016
  - Kinder Morgan 4.2 Contractor Qualification Specifications and Records, Effective January 8, 2016
  - EPC – Evaluation Matrix for Edmonton Terminal and Pump Stations Proponent’s Proposals Evaluation, dated Feb 2017
  - Kinder Morgan 0100 ISLMS 4.1 Incident Reporting and Investigation Standard, Revision 2, October 10, 2016
  - Kinder Morgan Incident, Workplace Hazard, and Near Miss Reporting Skill Packet, Revision: February 11, 2016
  - Kinder Morgan Job Description Questionnaire, Kinder Morgan Canada, 16 May 2017
  - Kinder Morgan ROCS Project Overview (In which KM identified all of their jobs and developed job descriptions for them and have employees review and sign off on them every year)(undated & unsigned). The first review and sign off was conducted July 2016.
  - Kinder Morgan Recruitment and Back Ground Check Process (undated & unsigned).
  - Sample Back Check Report (Names Redacted)
  - Memo – Bidding Process and Bid Evaluation Framework (issued for Implementation), TMEP/SCM – 003, 17 Dec, 2016
  - Environmental Plans, Volume 10, Compliance Management Plan for the Trans Mountain Expansion Project, 01-13283-GG-0000-RG-PLN-0001. May 2017, Rev 1.

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- Trans Mountain Expansion Project Quality Management Plan, Document # 01-13283-GG-0000-RPT-CM-0002, Rev 0, Dated: 2017-1-27
  - Kinder Morgan 0100 Integrated Safety and Loss Management System, Hazard and Risk Management, Hazard and Risk Guidelines (unsigned and undated).
  - KMC Unified Hazard List and Risk Register (unsigned and undated)
  - Kinder Morgan 0200 Quality Assurance Program, 2.6 ISLMS Management Review Process, Revision 0, Effective: October 31, 2016
  - Navigation and Navigation Safety Plan for the Trans Mountain Pipeline ULC Trans Mountain Expansion Project, NEB Condition 48, Document # 01-13283-GG-0000-CHE-RPT-0010 R1, Rev 1, Dated April 2017
  - Kinder Morgan 0100 Integrated Safety and Loss Management System, Hazard and Risk Management, 3.3 Operational Risk Management Procedure, Revision 0, Effective: January 31, 2017
  - Trans Mountain Expansion Project Quantitative Risk Analysis Process, Document # 01-13283-GG-0000-RPT-PM-00004, Revision A, Dated 2016-12-15
  - Trans Mountain Expansion Project Risk Management Program, Document #01-13283-GG-0000-RPT-PM-0002, Revision A, Dated 2016-10-30
  - TMEP Risk Register Overall April 2017
  - Kinder Morgan 0100 Integrated Safety and Loss Management System Management of Change, 4.1 Operational Change Management Standard Revision 1, Dated June 4, 2015
  - Trans Mountain Expansion Project Quality Management Plan, Document # 01-13282-GG-0000-RPT-CM-0002, Revision 0, Dated 2017-1-27
  - Kinder Morgan 0200 Quality Assurance Program Quality Assurance Management, 2.6 ISLMS Management Review Procedure
  - Kinder Morgan 0100 Integrated Safety and Loss Management System Document and Records Management, 6.1 Internal Communication Standard, Revision 0 (Draft 9), Dated February 9, 2016.
  - Landowner Consultation Approach (Unsigned and undated)
  - Landowner 2017-03-15 Newsletter Paragraphs
  - TMEP Management of Change Approvals Matrix – Revised 04/28/2017



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- Trans Mountain Expansion Project Health and Safety Management Program (HSMP) – HS Video Orientation, May 1, 2017
  - Trans Mountain Expansion Project Management of Change (MOC), Document # 01-13283-RPT-PM-0021, Revision A, Dated 2017-May-10
  - Job Descriptions for:
    - o Director Business Development
    - o Legal Assistant
    - o Manager Environment
    - o Manager Project Controls
    - o Project Manager
    - o Senior Admin Assistant
    - o Senior Compliance Advisor
    - o Senior Director Aboriginal and Legal Affairs
    - o Senior Director Major Projects
    - o Senior Director Marine Development
    - o Senior E/I Technical Specialist
    - o Senior Project Controller
    - o Senior Project Director, TMEP
    - o Senior Project Engineer
    - o Supervisor Project Services
  - Kinder Morgan Canadian Human Resources Policies and Guidelines (Dated December 2016?)
  - Kinder Morgan 0100 Integrated Safety and Loss Management System, Inspection, Measuring and Monitoring, Revision 0 (Draft 5), Dated September 27, 2016.
  - TMEP – Draft Owner Policies: Checklist and Guidance Document, Dated May 12, 2017.
  - Legal List

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- Access Management Plan for the Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Apr 2017, Rev 1, 687945, Document # 01-13283-GG-0000-CHE-RPT-0037 R1 and attachments
  - Appendix E – Planned Project Access Maps
  - Trans Mountain Expansion Project Emergency Management Program Attachment A Incident Communication Procedure, January 13, 2017 Draft R01
  - Trans Mountain Expansion Project Emergency Response Plan (ERP), May 8, 2017 Draft R02
  - Traffic and Access Control Management Plan, KMC No. 01-13283-GG-0000-HS-PLN-0003 RA, Date: March 28, 2017
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project Traffic and Access Control Management Plan, 681657/March 2017, Appendix A, Construction Access Management Maps, Road Crossings, Access Roads and Access Points
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Facilities Environmental Protection Plan, November 2016/664818
  - Environmental Plans Volume 3 Facilities, Environmental Protection Plan for the Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, May 2017, Rev 2, 687945, Document Number 01-13283-GG-0000-CHE-RPT-0027
  - Environmental Facility Drawing for the Edmonton Terminal and Pump Station
  - Environmental Facility Drawing for the Gainford Pump Station
  - Environmental Facility Drawing for the Wolf Pump Station
  - Environmental Facility Drawing for the Edson Pump Station
  - Environmental Facility Drawing for the Hinton Pump Station
  - Environmental Facility Drawing for the Hargreaves Trap Site
  - Environmental Facility Drawing for the Blue River Pump Station
  - Environmental Facility Drawing for the McMurphy Pump Station
  - Environmental Facility Drawing for the Blackpool Pump Station
  - Environmental Facility Drawing for the Darfield Pump Station
  - Environmental Facility Drawing for the Black Pines Pump Station





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- Environmental Facility Drawing for the Kamloops Terminal and Pump Station
  - Environmental Facility Drawing for the Edmonton Terminal and Pump Station
  - Environmental Facility Drawing for the Kingsvale Pump Station
  - Environmental Facility Drawing for the Hope Pressure Control Station
  - Environmental Facility Drawing for the Sumas Terminal
  - Environmental Facility Drawing for the Burnaby Terminal
  - CH2M Hill On-site Checklist for Vehicle Watercourse Crossings
  - CH2M Hill Trans Mountain Expansion Project – Equipment Cleaning Compressed Air and Manual Cleaning, 687945, May 2017, Dwg 3a
  - CH2M Hill Trans Mountain Expansion Project – Equipment Cleaning High Pressure Water, 687945, May 2017, Dwg 3b
  - CH2M Hill Trans Mountain Expansion Project – Vehicle Crossing Typical Ford, 687945, May 2017, Figure 7
  - CH2M Hill Trans Mountain Expansion Project – Narrow Down Fencing, 687945, May 2017, Figure 1
  - CH2M Hill Trans Mountain Expansion Project – Vehicle Crossing – Ramp and Culvert, 687945, May 2017, Figure 8
  - CH2M Hill Trans Mountain Expansion Project – Sediment Fence, 687945, May 2017, Figure 4
  - CH2M Hill Trans Mountain Expansion Project – Topsoil/Root Material Salvage, 687945, May 2017, Drawing 5
  - CH2M Hill Trans Mountain Expansion Project – Rare Plant Protection – Temporary Bridge, 687945, May 2017, Drawing 2
  - CH2M Hill Trans Mountain Expansion Project – Vehicle Crossing – Typical Temporary Bridge, 687945, May 2017, Drawing 6
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Temporary Construction Lands and Infrastructure Environmental Protection Plans, Table D-1, Resource-Specific Mitigation Measures for Environmental Features Encountered within Camps and Stockpile Sites and Associated Access Roads, 687945/May 2017,



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- 201701\_Map\_CH2M\_Fac-00989\_RevB\_F1, Regional Location of Temporary Construction Lands and Infrastructure in Alberta
  - 201701\_Map\_CH2M\_Fac-00989\_RevB\_F2, Regional Location of Temporary Construction Lands and Infrastructure in British Columbia
  - 201612\_Map\_CH2M\_Fac-00975\_RevE, Regional Location of Temporary Construction Lands and Infrastructure and Associated Access Roads
  - Environmental Plans, Volume 1, Temporary Construction Lands and Infrastructure Environmental Protection Plan for the Trans Mountain Pipeline ULC Trans Mountain Expansion Project, May 2017, Rev 1, 987945, Document Number 01-13283-GG-0000-CHE-RPT-0026 R1
  - National Energy Board, Detailed Incident Report
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Temporary Construction Lands and Infrastructure Environmental Protection Plan 687945/February 2017
  - CH2M Hill Trans Mountain Expansion Project – Erosion Control Matting, 687945, May 2017, Drawing 3
  - CH2M Hill Trans Mountain Expansion Project – Erosion and Sediment Control – Coir/Straw Log Installation, 687945, May 2017, Drawing 2
  - CH2M Hill Trans Mountain Expansion Project – Sediment Fence, 687945, May 2017, Drawing 1
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Burnaby Mountain Tunnel Environmental Protection Plan, 664818/May 2017
  - Environmental Plans Volume 9, Burnaby Mountain Tunnel, Environmental Protection Plan for the Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, May 2017, Rev 1, 687945, Document Number 01-13283-GG-0000-CHE-RPT-0028
  - Environmental Plans Volume 8, Environmental Alignment Sheet Package for the Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, September 2016, Rev 1, 664818, Document Number 01-13283-SG-0000-CHE-DWG-0001
  - CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_01\_AB\_004\_001 to 057
  - CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_02\_AB\_004\_058 to 114
  - CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_03\_BC1\_004\_115 to 161
  - CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_04\_BC1\_004\_162 to 206



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- CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_05\_207 to 253
  - CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_06\_BC2\_004\_254 to 299
  - CH2M Hill, Environmental Alignment Sheets, Alignment Sheets\_07\_LwrMnld\_004\_300 to 337
  - Environmental Plans Volume 7, Resource Specific Mitigation Tables for the Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, September 2016, Rev 0, 664818, Document Number 01-13283-GG-0000-CHE-RPT-0047 R0
  - Environmental Plans Volume 2, Pipeline Environmental Protection Plan for the Trans Mountain Expansion Project, May 2017 Rev 2, 687945, Document Number 01-13283-GG-0000-CHE-RPT-0006 R2
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Pipeline Environmental Protection Plans, Environmental Contingency Plans, 687945/May 2017
  - CH2M Hill Trans Mountain Expansion Project – All Drawings Combined (43 Drawings)
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Environmental Protection Plan: Reactivation, 665289/April 2017
  - Environmental Plans Volume 5, Environmental Protection Plan for the Trans Mountain Pipeline ULC, Pipeline Reactivation Program, May 2017 Rev 1, 665289, Document Number 01-13283-GG-0000-CHE-RPT-0012 R1
  - CH2M Hill Trans Mountain Expansion Project – Air/Bubble Curtain Installation (Pile Installation), 687945, May 2017, Drawing 3
  - CH2M Hill Trans Mountain Expansion Project – Infilling – Rock Armouring, 664818, November 2016, Drawing 4
  - CH2M Hill Trans Mountain Expansion Project – Turbidity Curtain Installation (Tidal Conditions), 687945, May 2017, Drawing 2
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Westridge Marine Terminal Environmental Protection Plan May 2017/687945
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Westridge Marine Terminal Environmental Protection Plan, Table D-1, Resource-Specific Mitigation Measures for Environmental Features Encountered Within the Westridge Marine Terminal, Rev 2, May 2017/687945
  - Traffic and Access Control Management Plan (NEB Condition #73), KMC No. 01-13283-GG-0000-HS-PLN-0003 RA, Date March 28, 2017



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- Trans Mountain Pipeline, Trans Mountain Expansion Project, Reactivation Access Management: Darfield to Black Pines Maps
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Reactivation Access Management: Hinton to Hargreaves Maps
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Lower Mainland Maps
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Spread 5
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Spread 6
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Spread 1
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Spread 2
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Spread 4
  - Trans Mountain Pipeline, Trans Mountain Expansion Project, Construction Access Management: Spread 3
  - Trans Mountain Pipeline ULC, Trans Mountain Expansion Project, Quantitative Geohazard Frequency Assessment – Post Mitigation, produced by BGC Engineering Inc., Project No.: 0095150-22, Dated February 27, 2017.
  - Trans Mountain Expansion Project, Quantitative Geohazard Frequency Assessment – Post Mitigation NEB Condition 16, Dated March 1, 2017
  - Trans Mountain Expansion Project Contractor Position Profile, Conditions Compliance Analyst, Dated January 2016
  - Trans Mountain Expansion Project Position Profile, Construction Manager, Pipelines, Dated August 27, 2016
  - Trans Mountain Expansion Project Contractor Position Profile, Contracts Specialist, Dated July 6, 2016
  - Trans Mountain Expansion Project Contractor Position Profile, Emergency Management Aboriginal Analyst, Dated January 12, 2017



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- Trans Mountain Expansion Project Contractor Position Profile, Environmental Specialist, Dated August 2015
  - Trans Mountain Expansion Project Position Profile, Health and Safety Manager, Dated March 29, 2017
  - Trans Mountain Expansion Project Position Profile, Safety Specialist (Health and Safety Manager), Dated September 08, 2015
  - Trans Mountain Expansion Project Contractor Position Profile, Manager Project Controls - Pipelines, Dated January 9, 2017
  - Trans Mountain Expansion Project Contractor Position Profile, Procurement Specialist, Dated July 6, 2016
  - Trans Mountain Expansion Project Position Profile, Project Manager, Pipeline, Dated August 27, 2016
  - Trans Mountain Expansion Project Contractor Position Profile, SCM Advisor – Aboriginal Affairs, Dated March 31, 2017
  - Trans Mountain Expansion Project Position Profile, Senior Project Engineer, Dated January 31, 2017
  - Trans Mountain Expansion Project Contractor Position Profile, Sitewide Services Manager, Dated October 21, 2016
  - Trans Mountain Expansion Project Contractor Position Profile, Project Planner/Scheduler, Dated September 2, 2016
  - MOC Workflow Sheet
  - CCAP Field Verification Check Form
  - 05.30.2017 Appendix 1 to Legal Requirement Procedure
  - Copy of LML EPC Contract Formation Matric May 31
  - Copy of Unified Hazard Listing and Register 31 May 2017
  - Legal Requirement Procedure
  - Legal Requirements Standard
  - Major Projects Management Plan Edit 7
  - 2017.05.31 Response to May 25 Audit Daily Summary

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- Documents in response to item 18 of the 25 May Daily Summary
  - Documents in response to item 19 of the 25 May Daily Summary
  - TMEP Stakeholder Engagement and Communications Plan dated 31 May 2017
  - Cameron Valves and Measurement Certificates of Calibration for Gage BV-5039, Gage BV-14066 and Chart Recorder 106500;
  - Cameron Testing Report SN 120943092
  - Cameron Hydrostatic Test Report and Chart SN 120943092-1
  - Cameron Hydrostatic Test Chart SN 120943092-2
  - Cameron Hydrostatic Test Report and Chart SN 120943092-3
  - Cameron Hydrostatic Test Report and Chart SN 120943092-4
  - DM Professional Services Ltd letter to Trans Mountain regarding Evaluation of Manufacturing Procedure Specification Submissions for Submerged Arc Welded Steel Pipe Supply, File C-17-201f 17 -04 22, dated April 22, 2017
  - DM Professional Services Ltd letter to Trans Mountain regarding Jindal SAW Limited – Trans Mountain Expansion Project Evaluation of Manufacturing Procedure Specification Submissions for Submerged Arc Welded Steel Pipe Supply, File C-17-201f 17 04 22, dated April 22, 2017
  - DM Professional Services Ltd letter to Trans Mountain regarding Jindal SAW Limited – Trans Mountain Expansion Project Evaluation of Manufacturing Procedure Specification Submissions for Category IIM5C Pipe for Strain-bases Design Applications, File C-17-201f 17 04 23, dated April 23, 2017
  - DM Professional Services Ltd letter to Trans Mountain regarding Jindal SAW Limited – Trans Mountain Expansion Project Evaluation of Manufacturing Procedure Specification Submissions for Submerged Arc Welded Steel Pipe Supply – CSA Z 245.1-14 Category IIIM45C, File C-17-201f 17 04 22-1, dated April 22, 2017
  - Perma Pipe Canada Coating Plant Review by Alan Kehr, dated February 10, 2017
  - Approved Manufacturer Change Request, dated March 30, 2017
  - Trans Mountain Expansion Project Approved Manufacturers List Deviation Procedure, Document No. 01-13283-GG-0000-RPT-PR-003
  - Trans Mountain Expansion Project Approved and Proposed Manufacturer's List (AML) & (PML), Document # 01-13283-GG-0000-TEC-PR-0001, Dated June 12, 2017



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- Pipe Purchase Agreement, Contract #102618;
  - SMJV Construction Quality Management Plan for Spread 5A;
  - TMEP UPI Quality Management Plan, Document # 01-13283-SG-M002-QA-PLN-001;
  - UPI WI-403-002-2012 Subcontractor Invoicing Procedure;
  - UPI WI-508-001-2011, Materials, Equipment and Services RFP;
  - TMEP Procurement Management Plan;
  - TMEP Scope of Work for Supplier Surveillance Services,  
Doc # 01-13283-SG-M002-SC-SOW-0001;
  - KLTP CPP-06 Quality Management Plan – DRAFT;
  - KM Procurement and Administration Corporate Bidding Policy
  - Trans Mountain Expansion Project, Project Procurement Execution Plan,  
Document # 01-13283-GG-0000-RPT-PR-0002, Dated May 04, 2017
  - Trans Mountain Expansion Project, RFP & Contracts Award Procedure,  
Document # 01-13283-GG-0000-RPT-PR-0001, Dated May 04, 2017

**Appendix VI - Trans Mountain Pipeline ULC. - Company Representatives Interviewed**

| <b>Company Representative Interviewed</b> | <b>Job Title</b>  |
|---|---|
| [REDACTED]                                | Vice President, Trans Mountain Expansion Project                    |
| [REDACTED]                                | Kinder Morgan Manager, Compliance                                   |
| [REDACTED]                                | Senior Director, Trans Mountain Expansion Project                   |
| [REDACTED]                                | Project Director, Lower Mainland, Trans Mountain Expansion Project  |
| [REDACTED]                                | Lead, Health, Safety and Security, Trans Mountain Expansion Project |
| [REDACTED]                                | Director SCM, Trans Mountain Expansion Project                      |
| [REDACTED]                                | Lead Environment, Trans Mountain Expansion Project                  |
| [REDACTED]                                | Senior Project Controller, Trans Mountain Expansion Project         |
| [REDACTED]                                | Lead, Emergency Management, Trans Mountain Expansion Project        |
| [REDACTED]                                | Kinder Morgan Regulatory Advisor                                    |



## Appendix VII - Board Direction and Guidance on the Corrective Action Plan (CAP)

During the CAP review, the NEB will review the deliverables as outlined by TMPU's CAP submission. Each finding will be considered resolved when all of the deficiencies as described in the report have been addressed in accordance with the legal requirements, the commitments and the actions described in the CAP. Meetings to discuss CAPs will be organized if required.

The Lead Auditor will liaise with TMPU's representative whom we have copied on this letter to arrange the document review for the CAP. If you require any further information or clarification during the review, please contact Mark Tinney Lead Auditor, at 403-966-1065.

| Finding Number | TMPU's Corrective Action  | Board Direction or Guidance   |
|----------------|---|---|
| 1              | <p>TMPU will establish a TMEP Management Plan for project construction that demonstrates how the construction project addresses the management system obligations and aligns, where applicable to Trans Mountain's Integrated Safety and Loss Management System (ISLMS) for ensuring safety, security and protection of the environment. The TMEP Management Plan will be a part of the overarching project Execution Plan.</p> | <p>The Board approves the CAP but with the following guidance. TMPU is reminded that section 6.1 of the OPR requires the management system to be systematic, comprehensive, and that it applies to all of the company's activities, which includes construction. During Implementation Assessment meetings with the Board, TMPU will provide details on where the project and the existing TMPU management system align and don't align. TMPU will also provide an explanation of which management system elements TMPU believes are not applicable to this project and how it still function as a management system.</p> |

| Finding Number | TMPU's Corrective Action  | Board Direction or Guidance  |
|----------------|---|--|
| 2              | <p>Trans Mountain will define as part of its integrated Safety and Loss Management System (ISLMS) the conditions that constitute "good faith" as applied in the ISLMS Safety and Loss Management Policy Statement for granting immunity from disciplinary action for persons who internally report hazards, potential hazards, incidents and near misses.</p> <p>Trans Mountain will ensure the policy around immunity from disciplinary action for reporting hazards and incidents is explained as part of the project construction Site Orientation Training, including the definition of "good faith".</p> | <p>The Board approves these corrective action plans.</p>   |
| 3              | <p>Trans Mountain's project construction organizational structure has been defined as part of TMEP Compliance to Condition 88, filed with the Board on July 23rd, 2017 and approved as compliant.</p>   | <p>Condition 88 was not for approval, it had to be filed two months in advance of construction. In reviewing TMPU's condition filing the Board noted that TMPU provided the same high level organizational charts that were previously provided during the audit document review phase. There is no new information or new activities as part of this CAP to address this finding.</p> <p>The Board directs TMPU to file their Project Execution Plan and Functional Area Sub-Plan which according to their own Major Projects Management Plan will address this CAP.</p> <p>The Board rejects this CAP.</p> |

| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance  |
|----------------|--|------------------------------|
| 4              | <p>The Trans Mountain Hazard Coordinator will work with the applicable project team members to establish a TMEP Unified Hazard List (UHL) by reviewing Trans Mountain's UHL to identify existing hazards applicable to the construction project.</p> <p>The Trans Mountain Hazard Coordinator will then work with the applicable project team members (i.e., Leads, Directors and SMEs) to identify and document in Trans Mountain's Hazard Application any additional hazards specific to the construction project. These newly identified construction related hazards will be added to the TMEP UHL which will be maintained and updated as a separate unified hazard listing used for the assessment of project specific construction hazards and risks.</p> | The Board approves this CAP. |
| 5              | The TMEP Unified Hazard List will be established as per the steps outlined in CAP # TMPU-12-1 and TMPU-12-2;   | The Board approves this CAP. |

| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance   |
|----------------|--|---|
| 6              | <p>The project will implement the ISLMS Hazard and Risk Management Standard and the Operational Risk Management (ORM) Procedure. The Hazard Coordinator will work with the project team members to identify all risks associated with TEMP Unified Hazards List (UHL), including risks associated with newly identified project-specific construction hazards and any additional risks related to existing Trans Mountain hazards on the TMEP UHL.</p> <p>The Hazard Coordinator will develop risk statements for all newly identified construction related hazards that incorporate credible contributing cause(s) and the possible event(s). The Hazard Coordinator will also identify existing risk statements on Trans Mountain's Unified Hazard and Risk Register (UHRR) that would be applicable to hazards identified by the project.</p> <p>Trans Mountain will conduct facilitated risk assessment session(s) with applicable project personnel to assess the risk statements for the construction project using the Trans Mountain Risk Matrix and Operational Risk Management (ORM) Procedure. This will include the identification of control measures (preventative and mitigative) for the reduction of inherent risks. The risk assessment results will establish a project specific TMEP Unified Hazard and Risk Register.</p> | <p>The Board approves this CAP but directs TMPU to ensure the newly created project specific Hazard Inventory and Risk Register are shared with all contractors and others who will require it for the project.</p> |

| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance   |
|----------------|--|---|
| 7              | <p>Trans Mountain will communicate the TMEP Unified Hazard and Risk Register (UHRR) to all project contractors (EPC, GCC &amp; CM&amp;I), as part of contract requirements outlined in Exhibit C: Owner Requirements, along with requirements for the contractor to:</p> <ul style="list-style-type: none"> <li>- Review the TMEP UHRR and identify all applicable hazards and associated risks related to the contractor's construction spread and scope of work, including any additional hazards and risks not identified on the TMEP UHRR;</li> <li>- Develop a Contractor Specific Hazard and Risk Register (CSHRR) based on their identified hazards and associated risks;</li> <li>- Identify in their CSHRR similar or equivalent controls to those in the TMEP UHRR, where applicable), that the contractor will use to address the specific hazards and associated risks,</li> </ul> <p>Each project contractor shall submit their CSHRR (with their specific preventative and mitigative controls listed) for review and approval by Trans Mountain.</p> <p>Trans Mountain will communicate as part of Exhibit C: Owner Requirements its expectations for project contractors (EPC, GCC or CM&amp;I) to document as part of their</p> | <p>The Board approves this CAP but directs TMPU to ensure information on imminent or significant hazards is shared between all contractors involved in the project.</p> |

| Finding Number | TMPU's Corrective Action  | Board Direction or Guidance |
|----------------|---|-----------------------------|
|                | <p>Contractor Execution Plan (CEP), the control measures and contingency plans the contractor will use to prevent and mitigate hazards and associated risks identified on their Contractor Specific Hazard and Risk Register (CSHRR).</p> <p>Each contractor's CSHRR should reference control measures and contingency plans in the CEP used to address the specific contractor risks.</p> <p>Each contractor shall submit for review and approval by Trans Mountain their CSHRR (with references to the controls and contingency in the CEP).</p> <p>Trans Mountain will communicate to project contractors (EPC, GCC and CM&amp;I) as part of Exhibit C: Owner Requirements its expectations for project contractors to document within their Contractor Execution Plan (CEP), the process they will implement for reporting hazards and potential hazards by any person on the construction site.</p> <p>The process should include the steps for reporting and managing imminent hazards. Additionally, it shall describe the contractor's responsibility to:</p> <ul style="list-style-type: none"> <li>- maintain a list of all reported hazards and potential hazards; and</li> <li>- provide consistent reporting on any significant hazards (i.e., requiring corrective actions) to Trans Mountain's Construction Management and Inspection (CM&amp;I) team, including a description of any</li> </ul> |                             |

| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance   |
|----------------|--|---|
|                | <p>preventative or mitigative actions taken by the contractor to address the reported hazards and potential hazards. The CM&amp;I team will be expected to ensure all significant hazards have been appropriately addressed by the contractor and provide reporting to TMEP at least weekly, on all significant hazards and potential hazards, along with any mitigative actions taken and preventive controls implemented.</p>  |   |
| 8              | <p>Trans Mountain will update its project specific Management of Change (MOC) process to document the requirements for all MOC decisions to be adequately communicated to those who require the information. This will include defining the roles and responsibilities of the MOC requestor for communicating information and the expectations of those receiving the MOC communication for disseminating the information to applicable project staff and contractors. The MOC process owner will also ensure changes to the project MOC process are appropriately communicated to Trans Mountain staff.</p> | <p>The Board approves the CAP but directs TMPU to demonstrate to the Board during Implementation Assessment meetings how one project MOC process will address all of the requirements of OPR 6.5(1)(i).</p> |

| Finding Number | TMPU's Corrective Action  | Board Direction or Guidance   |
|----------------|---|---|
| 9              | <p>Trans Mountain communicates information to project contractors through its contract terms outlined in Exhibit C: TMEP Owner Requirements to make its contractors aware of special conditions associated with project construction. Trans Mountain will provide an example of contract owner requirements for project construction.</p>   | <p>The Board has previously reviewed TMPU's Project Procurement Execution Plan and the Project RFP &amp; Contracts Award Procedure. TMPU had previously pointed to these documents to answer this audit protocol question. Without changes to these documents, the Board does not know where TMPU would have made the process changes needed to address the finding. TMPU will have to either re-submit this CAP or provide clear documentation to the Board during the Implementation Assessment meetings.</p> |
| 10             | <p>Trans Mountain will implement a process for inspection, measurement and monitoring activities that is consistent with the requirements established in the ISLMS Inspection, Measurement and Monitoring (IMM) Standard and the ISLMS Inspection, Measurement and Monitoring Procedure used by Tran's Mountain's existing operations.</p> <p>Each project discipline will develop a Monitoring Plan which documents the planned inspection, measurement and monitoring activities for Health and Safety (including Damage Prevention and Emergency Response), Environmental, Security and Quality Management. These plans at a minimum will provide:</p> | <p>The Board approves this CAP.</p>   |



| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance |
|----------------|--|-----------------------------|
|                | <ul style="list-style-type: none"> <li>- an identification and description of the monitoring activities to be conducted;</li> <li>- The Trans Mountain or contractor roles (CM&amp;I, EPC or GCC) that will be responsible for conducting the IMM activities,</li> <li>- The project personnel responsible for reviewing and following up on the monitoring results, and,</li> <li>- the frequency/schedule for the planned monitoring,</li> </ul> <p>These monitoring plans will be fluid and updated frequently over the projects lifecycle to reflect the changing risks and issues that will be encountered during project construction.</p> <p>The Monitoring Plans will be consolidated into one comprehensive TMEP Project Construction Monitoring Plan and communicated to the contractors (CM&amp;I, EPC and GCC) as part of Exhibit C - Owner Requirements with the expectation that the contractors use the information in developing their Contractor Execution Plans.</p> |                             |

| Finding Number | TMPU's Corrective Action  | Board Direction or Guidance  |
|----------------|---|------------------------------|
| 11             | <p>Trans Mountain will develop a Project Construction Monitoring Plan Procedure applicable to all the project disciplines (Health and Safety, Environment, Quality and Security) that will define the process for each discipline to:</p> <ul style="list-style-type: none"> <li>- conduct periodic reviews and updates to the Monitoring Plans to reflect any changes required over the lifecycle of the project,</li> <li>- communicate and manage deficiencies identified during monitoring (with the contractors), including the process for handling of deficiencies requiring immediate attention,</li> </ul> <p>The TMEP Project Construction Monitoring Plan Procedure will be a preamble to the TMEP Project Construction Monitoring Plan as part of Exhibit C - Owner Requirements provided to the contractors with the expectation that the contractors (CM&amp;I, GCC and EPC) use the information to develop their project-specific Contractor Execution Plan (CEP).</p> | The Board approves this CAP. |
| 12             | TMPU's proposed corrective action for this non-compliance was addressed in NC Finding 12 (above).   | The Board approves this CAP. |

| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance   |
|----------------|--|---|
| 13             | <p>Trans Mountain will review its Approved Manufacturer's List (AML) and update it with any existing project contractors currently not on the AML.</p> <p>Trans Mountain will also re-enforce with the project Supply Chain Management (SCM) team the importance of timely updates and maintenance of the Project AML.</p> <p>TMPU has indicated in its CAP that the purpose and intent of the referenced language within the referenced contract was not to delegate Trans Mountain's responsibilities for conformance of the work to codes and regulations to a third-party vendor.</p> <p>Trans Mountain acknowledges in the CAP that it cannot delegate its responsibilities for conformance of work to codes and regulations.</p> <p>Trans Mountain has hired a Chief Quality Assurance Lead for project execution. The QM Lead started August 8, 2017.</p> | <p>TMPU's proposed actions will resolve the issue with the AML.</p> <p>TMPU has acknowledged that it cannot and will not delegate its responsibilities for conformance of the work to codes and regulations to a third-party vendor.</p> <p>The hiring of a qualified individual to fulfill the role of Chief Quality Assurance Lead, will resolve the concern the Board had with the position being vacant at the time of the audit.</p> <p>The Board approves this CAP.</p> |

| Finding Number | TMPU's Corrective Action   | Board Direction or Guidance   |
|----------------|--|---|
| 14             | <p>Trans Mountain will update its project specific Management of Change (MOC) process to reflect the liaison between existing Operations Management and the project Construction Management to identify operational issues and/or synergies during project construction that require review, and approval by Trans Mountain's existing operations. The project specific MOC process will describe the MOC responsibilities of designated operational personnel to:</p> <ul style="list-style-type: none"> <li>- Evaluate the justification and impact of temporary impairments or permanent changes to operating systems requested by project construction management;</li> <li>- Follow the ISLMS Operational Change Management Standard to develop and submit Change Management Request (CMR) forms for temporary impairments or permanent changes to operating systems as a result of project construction, with appropriate justification and back-up documentation; and</li> <li>- Ensure the appropriate level of review and approval that is consistent with Trans Mountain's CMR Approval Authority Matrix, for changes affecting existing operating systems.</li> </ul> <p>The project specific MOC process will also be updated to provide additional clarity and direction on the use the MOC process for addressing design, regulatory and procedural changes.</p> | <p>The Board approves the CAP but directs TMPU to demonstrate to the Board during Implementation Assessment meetings how one project MOC process will address all of the requirements of OPR 6.5(1)(i).</p> |

