



**AMERICAN BADGER MITIGATION AND
HABITAT RESTORATION PLAN
FOR THE
TRANS MOUNTAIN PIPELINE ULC
TRANS MOUNTAIN EXPANSION PROJECT
NEB CONDITION 44**

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Prepared for:



TRANSMOUNTAIN

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TABLE OF CONCORDANCE

National Energy Board (NEB) Condition 44 is applicable to the following legal instruments: OC-064 (CPCN), AO-003-OC-2 (OC2), XO-T260-007-2016 (Temp), XO-T260-008-2016 (Pump 1) and XO-T260-009-2016 (Pump 2). Table 1 describes how this Plan addresses the Condition requirements applicable to Project activities.

TABLE 1

LEGAL INSTRUMENT CONCORDANCE WITH NEB CONDITION 44: WILDLIFE SPECIES AT RISK MITIGATION AND HABITAT RESTORATION PLANS

NEB Condition 44	OC-064 (CPCN)	AO-003-OC-2 (OC2)	XO-T260-007-2016 (Temp)	XO-T260-008-2016 (Pump1)	XO-T260-009-2016 (Pump2)
Trans Mountain must file with the NEB for approval, at least 4 months prior to commencing construction, Wildlife Species at Risk Mitigation and Habitat Restoration Plans for each species whose draft, candidate, proposed, or final critical habitat is directly or indirectly affected by the Project. Each plan must include	Section 4.0 of this Plan	Section 4.0 of this Plan	Section 4.0 of this Plan	Section 4.0 of this Plan	Section 4.0 of this Plan
a) a summary of supplementary pre-construction survey results, including surveys for biophysical attributes of critical habitat;					
b) the location and type of critical habitat, for those wildlife species with early draft and candidate critical habitat, including a description of the biophysical attributes, potentially directly and indirectly affected by the Project;	Section 3.2 and 4.2 of this Plan	Section 3.2 and 4.2 of this Plan	Section 3.2 and 4.2 of this Plan	Section 3.2 and 4.2 of this Plan	Section 3.2 and 4.2 of this Plan
c) the location, types and total spatial area for each type of critical habitat for those wildlife species with proposed or final critical habitat, including a description of the biophysical attributes, potentially directly and indirectly affected by the Project;	N/A – critical habitat is early draft, as described in Section 1.0 of this Plan.	N/A – critical habitat is early draft, as described in Section 1.0 of this Plan.	N/A – critical habitat is early draft, as described in Section 1.0 of this Plan.	N/A – critical habitat is early draft, as described in Section 1.0 of this Plan.	N/A – critical habitat is early draft, as described in Section 1.0 of this Plan.
d) a detailed description of measures that will be used to avoid the destruction of critical habitat;	Section 5.1 of this Plan.	Section 5.1 of this Plan.	Section 5.1 of this Plan.	Section 5.1 of this Plan.	Section 5.1 of this Plan.
e) a detailed description of mitigation and habitat restoration measures to be implemented to reduce direct and indirect Project effects on critical habitat, including all relevant measures committed to throughout the OH-001-2014 proceeding, any new mitigation measures resulting from supplementary surveys, detailed criteria using clear and unambiguous language that describes the circumstances under which each measure will be applied, and measurable targets for evaluating mitigation and critical habitat restoration success;	Sections 5.0 and 6.0 of this Plan.	Sections 5.0 and 6.0 of this Plan.	Sections 5.0 and 6.0 of this Plan.	Sections 5.0 and 6.0 of this Plan.	Sections 5.0 and 6.0 of this Plan.
f) identification and review of alternative mitigation and habitat restoration measures to avoid or lessen direct and indirect Project effects on critical habitat, and the rationale for the selected measure(s);	Section 5.0 of this Plan.	Section 5.0 of this Plan.	Section 5.0 of this Plan.	Section 5.0 of this Plan.	Section 5.0 of this Plan.
g) detailed description of how selected mitigation and critical habitat restoration measures address the potential for time lags between when the Project impacts occur and when mitigation and critical habitat restoration measures are implemented and are fully functional;	Section 5.2 of this Plan.	Section 5.2 of this Plan.	Section 5.2 of this Plan.	Section 5.2 of this Plan.	Section 5.2 of this Plan.
h) details on post-construction monitoring of mitigation measures and critical habitat restoration measures, including survey methods, corrective measures, detailed criteria using clear and unambiguous language that describes the circumstances under which each measure will be applied, and a proposed reporting schedule;	Section 7.0 of this Plan.	Section 7.0 of this Plan.	Section 7.0 of this Plan.	Section 7.0 of this Plan.	Section 7.0 of this Plan.
i) details on how the mitigation, critical habitat restoration measures, and monitoring measures are consistent with applicable recovery strategies and action plans;	Sections 1.4 and 3.3 of this Plan	Sections 1.4 and 3.3 of this Plan	Sections 1.4 and 3.3 of this Plan	Sections 1.4 and 3.3 of this Plan	Sections 1.4 and 3.3 of this Plan
j) a commitment to include the results of the monitoring in the Post-Construction Environmental Monitoring (PCEM) reports filed under Condition No. 151;	Section 7.4 of this Plan.	Section 7.4 of this Plan.	Section 7.4 of this Plan.	Section 7.4 of this Plan.	Section 7.4 of this Plan.
k) a description of how Trans Mountain has taken available and applicable Aboriginal Traditional Land Use (TLU) and Traditional Ecological Knowledge (TEK) into consideration in developing the plans including demonstration that those Aboriginal persons and groups that provided Aboriginal traditional land use information and traditional ecological knowledge, as reported during the OH-001-2014 proceeding and/or pursuant to Condition 97, had the opportunity to review and comment on the information;	Sections 1.2, Appendices A and B of this Plan.	Sections 1.2, Appendices A and B of this Plan.	Sections 1.2, Appendices A and B of this Plan.	Sections 1.2, Appendices A and B of this Plan.	Sections 1.2, Appendices A and B of this Plan.
l) a summary of its consultations with Appropriate Government Authorities, any species experts, potentially affected Aboriginal groups and affected landowner/tenants. In its summary, Trans Mountain must provide a description and justification for how Trans Mountain has incorporated the results of its consultation, including any recommendations from those consulted, into the plan; and	Section 2.0 and Appendix A of this Plan.	Section 2.0 and Appendix A of this Plan.	Section 2.0 and Appendix A of this Plan.	Section 2.0 and Appendix A of this Plan.	Section 2.0 and Appendix A of this Plan.
m) confirmation that Trans Mountain will update the relevant Environmental Protection Plan(s) (EPP) to include any relevant information from the Wildlife Species at Risk Mitigation and Habitat Restoration Plans.	Section 5.0 of this Plan.	See above.	Section 5.0 of this Plan.	Section 5.0 of this Plan.	Section 5.0 of this Plan.

EXECUTIVE SUMMARY

The American Badger Mitigation and Habitat Restoration Plan (the Plan) was prepared to address the requirements of National Energy Board (NEB) Condition 44 that requests a Wildlife Species at Risk Mitigation and Habitat Restoration Plan for each species whose early draft, candidate, proposed or final critical habitat is directly or indirectly affected by the Trans Mountain Expansion Project ("the Project"). American badger, *Jeffersonii* ssp., is listed as Endangered on Schedule 1 of the *Species at Risk Act* (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) and red-listed in British Columbia (BC). A portion of the Project is located within early draft critical habitat for American badger as identified by Environment and Climate Change Canada (ECCC, formerly Environment Canada [EC]). The primary Project interactions with American badger are expected to be potential direct disturbance of habitat (e.g., disruption of burrows, alteration of soil structure), temporary displacement of prey species from the Project Footprint and barriers to movement during construction. Reduced habitat effectiveness as a result of sensory disturbance is expected to be negligible due to the localized and short-term, progressive nature of construction activities and implementation of mitigation measures related to scheduling and protection of active burrows.

Wildlife field work completed in 2013, 2014 and 2015 included searches for American badger dens/burrows and evidence of badger activity (i.e., fresh digging and tracks). In summer 2014 and 2015, field crews also collected preliminary information on the presence or absence of the biophysical attributes of critical habitat within the area identified by ECCC as early draft critical habitat. As a result of the field work completed in 2014 and 2015, it was concluded that identification of critical habitat for American badger is challenging based only on the biophysical attributes provided by ECCC, and therefore it was determined that field work should focus primarily on the identification of American badger burrows, as well as selected prey species (Columbian ground squirrel and yellow-bellied marmot), using guidance from further desktop review of suitable habitat. Going forward, Trans Mountain's approach is to use available information to identify areas with highest potential for burrowing mammal activity, specifically American badger, yellow-bellied marmots and Columbian ground squirrels and target these areas for pre-construction surveys.

This Plan demonstrates Trans Mountain Pipeline ULC's (Trans Mountain) commitment to avoid and mitigate Project effects on American badger and their habitat through application of mitigation and restoration measures. Following a hierarchy of mitigative actions, Trans Mountain has considered measures to avoid Project effects to American badger and their critical habitat and will apply appropriate measures to minimize Project effects, followed by implementation of habitat restoration measures. Mitigation measures developed as part of this Plan include, but are not limited to, consideration of scheduling activities to avoid important periods for American badger, identifying maternal den sites prior to activities scheduled during this sensitive period, proper soils handling techniques and limiting barriers to badger movement during construction. Measurable goals, and targets and details of post-construction environmental monitoring (PCEM) to be used to evaluate the effectiveness of mitigation and habitat restoration measures are provided.

This Plan was developed in consideration of the current regulatory policies specific to American badger including the provincial Recovery Strategy for the Badger (*Taxidea taxus*) in BC, as well as consultation with Appropriate Government Authorities and species-technical experts. Applicable Aboriginal Traditional Land Use (TLU) and traditional ecological knowledge (TEK) are also incorporated.

This Plan will be included as part of the Environmental Management Plans (Section 6.0 of Volume 6 of the Environmental Plans) and summarized and updated in the Resource-Specific Mitigation Tables (Section 4.0 of Volume 7 of the Environmental Plans) associated with the Pipeline Environmental Protection Plan and Environmental Alignment Sheets to ensure that the mitigation and restoration measures are implemented. The results of PCEM for American badger will be provided in the PCEM reports to be filed by Trans Mountain as per NEB Condition 151.

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1.0 INTRODUCTION

The American Badger Mitigation and Habitat Restoration Plan (the Plan) was prepared to address the requirements of National Energy Board (NEB) Condition 44 for the Trans Mountain Expansion Project (“the Project” or “TMEP”) where it encounters early draft critical habitat for American badger. The Plan was submitted to Appropriate Government Authorities, potentially affected Aboriginal groups and species experts on September 16, 2016 for review. The feedback was originally requested by January 13, 2017, however, feedback received as recently as July 2017 has been considered. Trans Mountain Pipeline ULC (Trans Mountain) incorporated any feedback into the revised Plan or has provided rationale for why input has not been included, as summarized in Appendix A.

Since the September 16, 2016 release of the draft Plan, engineering design has continued to progress and there have been design updates that are described in detail in the TMEP Fall 2016 Project Updates (www.transmountain.com/environmental-plans). All of the design updates have been reviewed, and the Project design updates that are relevant have been incorporated into this Plan.

This Plan has been prepared to describe planning considerations, mitigation and restoration measures to reduce potential effects of the Project on American badger and their habitat. American badger, *Jeffersonii* ssp. (*Taxidea taxus jeffersonii*) (hereafter referred to as American badger), are listed as Endangered on Schedule 1 of the *Species at Risk Act* (SARA) (Government of Canada [GoC] 2017) and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) (2017), and are red-listed in British Columbia (BC) (BC Conservation Data Centre [CDC] 2017). The pipeline route crosses areas identified as early draft critical habitat by Environment and Climate Change Canada (ECCC, formerly Environment Canada [EC]) (EC 2014a,b) for approximately 119 km (see Section 3.2 for further detail).

1.1 Project Description

Trans Mountain filed its Facilities Application (the Application) with the NEB in December 2013. In developing its Application, Trans Mountain commenced an engagement and communications program of extensive discussions with landowners, engagement with Aboriginal groups and consultation with affected stakeholders. This program was intended to gather input from these groups into the Application and supporting Environmental and Socio-Economic Assessment (ESA), and to continue to assist Trans Mountain in the design and execution of the Project. Trans Mountain is also working with Appropriate Government Authorities to carry out the necessary reviews, studies and assessments required for the Project.

For ease of description, the following terms are used:

Kilometre Post (KP): describes distances measured along the centreline of the pipeline.

Project Footprint: includes the area directly disturbed by surveying, construction, clean-up and operation of the pipeline, as well as associated physical works and activities (including the temporary construction lands and infrastructure, the pipeline, reactivation, facilities, the Westridge Marine Terminal and access roads). For clarity, specific components of the Project Footprint are further described by Trans Mountain below.

- Temporary construction lands and infrastructure refers to preparatory works to support Project construction and includes temporary camps, stockpile sites, equipment staging areas and borrow pits, as well as access roads within the first 10 km of each designated construction spread. For ease of assessing Project interactions, these access roads are considered as part of the overall access road network.
- Pipeline construction footprint refers to the total area used to construct the pipeline and includes the right-of-way and temporary workspace (TWS).
- Reactivation of currently deactivated pipeline segments include an engineering assessment under Section 45 of the Onshore Pipeline Regulation and associated construction activities. Currently known ground disturbance activities and associated access (as of December 2016) were assessed to determine the Project interactions. For ease of assessing Project interactions, these access roads were considered as part of the overall access road network.

- Facilities refer to pump stations, terminals (Edmonton, Sumas and Burnaby), and associated infrastructure (i.e., traps), most of which are located on land that has been previously disturbed. Westridge Marine Terminal has infrastructure located on land and in the marine environment, and is included in the Facilities component of the Project.
- Access roads include new temporary and permanent roads and existing roads that may require upgrades or improvements. For ease of assessing Project interactions, this includes the access roads to be developed as part of temporary construction lands and infrastructure, as well as those accesses associated with reactivation.

Contingency Alternate Routes refer to three alternate pipeline route segments that have been assessed for use if construction on the preferred route is not feasible. These are not included in the Project Footprint defined above since they are considered contingency alternates.

- Raft River, in BC (KP 713.1 to KP 714.4), is an alternate open cut contingency alignment. The preferred primary crossing method, a horizontal directional drill (HDD), does not support an open cut contingency crossing method at the same location.
- Pembina River, in Alberta (KP 133.0 to KP 134.7), is an alternate open cut contingency alignment. Similar to Raft River, the preferred primary crossing method (HDD) does not support an open cut contingency crossing method at the same location.
- Westridge Delivery Lines (WDL) (WDL KP 0.0 to WDL KP 3.4) is an alternate contingency alignment for a trenched installation around the Burnaby Conservation Area in BC. The preferred pipeline corridor requires tunnel construction and does not support a trenched contingency option; therefore, an alternate trenched contingency alignment has been identified.

Variances: as part of the Project Footprint update that occurred in December 2016, a number of route revisions located outside of the Project corridor were identified. Trans Mountain is in the process of seeking approval from the NEB in 2017 for these route realignments. All of the variances have been reviewed in consideration of impacts to this Plan and no revisions were required as a result, with the exception of minor adjustments to KP ranges, where applicable.

1.2 Traditional Ecological Knowledge and Traditional Land Use

Trans Mountain has engaged with Aboriginal groups who might have an interest in the Project or have Aboriginal interests potentially affected by the Project, based on the proximity of their community and their assertion of traditional and cultural use of the land along the pipeline route to maintain a traditional lifestyle. Appendix B provides a summary of Aboriginal participation in wildlife field work as well as Traditional Land Use (TLU) opportunities for Aboriginal groups whose traditional territories cross early draft critical habitat for American badger. The wildlife field work listed in Appendix B includes a variety of wildlife survey types (e.g., breeding bird, amphibian) and are not specific to American badger, nor are the surveys specific to the area of American badger early draft critical habitat. To date, no TLU or Traditional Ecological Knowledge (TEK) feedback regarding American badger has been provided by Aboriginal groups. However, during Project engagement, the Nicola Tribal Association and Shackan Indian Band expressed concern regarding the American badger being displaced from its natural habitat, putting the species further at risk. Residual environmental effects of Project construction and operations on wildlife species such as American badger will be not significant, in consideration of the mitigation and restoration measures proposed in this Plan. Appendix A provides more detail on the engagement process.

1.3 Mitigation Hierarchy

Throughout all stages of the development of this Plan, Trans Mountain has applied the mitigation hierarchy of avoid, minimize and restore on-site as described in the Policy and Procedures for Mitigating Impacts on Environmental Values (BC Ministry of Environment [BC MOE] 2014a,b). Following this hierarchy, Trans Mountain has considered measures to avoid direct and indirect Project effects on American badger and their critical habitat where site conditions and construction constraints allow. Where effects cannot be avoided, appropriate measures to minimize and mitigate Project effects, and restore habitat on-site to alleviate the Project's residual effects will be implemented. The last step of the

mitigation hierarchy is offsets. This step is only appropriate if residual impacts remain even after measures to avoid, minimize, and/or restore on-site have been taken. The determination of offsets is the responsibility of the province (BC MOE 2014a,b). Trans Mountain will maintain ongoing consultation with the province during the development, implementation and monitoring components of this Plan. Trans Mountain is required by the BC Environmental Assessment Office (EAO) as per BC EAO Condition 16 to prepare a Wildlife Species at Risk Mitigation and Preliminary Offset Plan that is due at least six months before the commencement of operations. A final offset plan is required if monitoring of habitats indicates that impacts remain after five years following the commencement of operations.

Measures to avoid, minimize and restore on-site are provided in Section 5.0.

1.4 Objective and Measurable Goals

The objective of this Plan is to mitigate potential Project effects on areas with highest potential for burrowing mammal activity, specifically American badger burrows. Critical habitat has not yet been finalized for American badger. The broadly delineated early draft critical habitat identified is expected to be refined in the future by ECCC. Trans Mountain will continue to consult with ECCC to obtain the most current critical habitat delineation, biophysical attributes of critical habitat and Recovery Strategy.

In the absence of final critical habitat and federal Recovery Strategy for American badger, the measurable goals for this Plan are defined based on the recovery objectives and approaches outlined in the provincial Recovery Strategy for the Badger (*Taxidea taxus*) in BC (the provincial Recovery Strategy, BC Badger Recovery Team 2016), and the likely Project interactions with biophysical attributes of critical habitat for American badger. Therefore, although many of the mitigation measures will be implemented more broadly within the currently mapped early draft critical habitat, the measurable goals are specific to locations with the biophysical attributes of critical habitat for American badger.

The measurable goals of the Plan are to:

1. maintain soil characteristics that allow for digging, where present prior to construction;
2. restore disturbed vegetation to open habitats consistent with surrounding land use and vegetation communities; and
3. avoid mortality of badger during construction and operations.

These goals align with the provincial Recovery Strategy goals and objectives that target maintenance of suitable habitat, stewardship and, badger survivorship and population management (refer to Section 3.3 for information on regulatory guidelines and policies).

The performance indicators and targets that will be monitored to evaluate the effectiveness of the mitigation in achieving these goals are described in Section 6.0. Monitoring will be focused within those areas containing the biophysical attributes of critical habitat for American badger.

1.5 Commitment Management

Trans Mountain made a number of commitments regarding the Project during the OH-001-2014 proceedings and engagement activities up to May 2016. Commitments were made to improve and optimize Project planning and mitigation measures. As Trans Mountain has consolidated its commitments into a Commitments Tracking Table in accordance with NEB Condition 6, the table of commitments in each plan has been removed.

The updated Commitments Tracking Table was filed with the NEB pursuant to NEB Condition 6 and is available on Trans Mountain's web site at <https://www.transmountain.com/commitments-tracking>. Trans Mountain continues to monitor and track compliance with its commitments and will update, post to its website and file with the NEB updated versions of the Commitments Tracking Table according to the timeframes outlined in NEB Condition 6. Commitments with specific relevance to this Plan have been considered and incorporated in this Plan.

2.0 CONSULTATION AND ENGAGEMENT

Consultation and engagement activities related to American badger and their habitat were conducted between May 2012 and July 2017 with Appropriate Government Authorities, potentially affected Aboriginal groups, species experts, and affected landowners/tenants. Opportunities to discuss American badger and issues or concerns were provided to public stakeholders through online information, workshops, meetings and ongoing engagement activities during the reporting period. Appendix A includes a comprehensive record of these engagement activities, stakeholder feedback and Trans Mountain responses.

The draft Plan was released on September 16, 2016 for review. The feedback was originally requested by January 13, 2017, however, feedback received as recently as July 2017 has been considered. Subsequently, two additional potentially affected Aboriginal groups were identified by the Board and Trans Mountain and provided a copy of the Plan on July 6, 2017 for feedback. No feedback specific to this Plan has been received from these additional Aboriginal groups to date. Trans Mountain incorporated any feedback into the revised Plan or has provided rationale for why input has not been included, as summarized in Appendix A.

Engineering design changes were issued in the TMEP Fall 2016 Project Update document (www.transmountain.com/environmental-plans) along with a request for feedback. No revisions to this Plan were required as a result of the design updates, with the exception of minor adjustments to KP ranges.

3.0 CONTEXT AND APPROACH

This section summarizes the ecological and regulatory context of the Project's potential interaction (direct and indirect) with American badger, which is the basis and rationale for the approach taken in the development of this Plan. Potential Project effects on American badger were assessed in response to GoC – EC Information Requests (IRs) 1.028a (Filing ID [A3Y2K9](#)) and 2.035 (Filing ID [A4H6A5](#)). Potential Project effects are discussed in Section 3.1; however, this section is not intended to provide a formal assessment. Refer to the original ESA (Filing ID [A3S1Q9](#)) and GoC EC IRs 1.028a and 2.035 for more detail and definitions of assessment criteria.

3.1 Ecology and Project Effects

The western *jeffersonii* ssp. unit is considered to be in decline (COSEWIC 2012). Changes in habitat as a result of construction are associated with disruption of burrows, reduced habitat effectiveness from sensory disturbance during construction, and alteration of soil structure that could affect badgers' ability to burrow or the availability of prey. Badgers use a wide variety of natural and human modified open habitat types, including deserts, grasslands, forest clearings, alpine areas, agricultural fields, road rights-of-way, golf courses and clear-cuts (EC 2015). Badgers are often associated with anthropogenic environments (COSEWIC 2012) and the main threat for badger populations in BC is road mortality. Other threats include habitat loss related to residential and commercial development, cultivation agriculture, viniculture and orchards, mining, secondary poisoning via prey, persecution, fire suppression, and off-road vehicle use (BC Badger Recovery Team 2016). Transportation corridors were identified as a major source of mortality in a study conducted in the Thompson Region (Weir *et al.* 2003, Weir *et al.* 2004, Klafki 2014). Activities likely to destroy critical habitat include soil tilling and clearing of natural vegetation, construction of anthropogenic developments, long-term fire suppression, and anthropogenic features that lack safe passage (EC 2015).

The badgers' diet consists primarily of fossorial (*i.e.*, burrowing) rodents, such as ground squirrels, pocket gophers and marmots, although voles and mice are common prey as well (COSEWIC 2012). Columbian ground squirrels and yellow-bellied marmots are active for only a short time each year with the hibernation period extending from late spring/early fall through mid-April to early June (Hoodicoff 2006). Breeding for Columbian ground squirrels occurs shortly after emergence and lasts for about three weeks, with young born between mid-May and July. Breeding for yellow-bellied marmots occurs within the first two weeks after emergence, with young born in May or June. During maternal and hibernation periods, these prey species may be particularly vulnerable to disturbance and increased mortality risk from construction activities.

Small mammal prey species may occur at lower density in disturbed areas in the short term (Bramble *et al.* 1992, Lauzon *et al.* 2002). However, small mammals have been shown to recolonize recently disturbed areas following pipeline construction (Lauzon *et al.* 2002). Following construction and reclamation, small mammal species will recolonize as vegetation becomes suitable (*i.e.*, generalist species such as deer mice colonize first, followed by more specialist species such as pocket gophers and voles) (Clarke *et al.* 2006, B. Fox and M. Fox 1984, Monamy and Fox 2000). As small mammals are primarily herbivorous and diets may include insects, studies have shown that small mammal recolonization of disturbed areas is more closely linked to vegetation community and structure than to time passed since disturbance (Bramble *et al.* 1992, Clarke *et al.* 2006, B. Fox and M. Fox 1984, Monamy and Fox 2000). For badgers, a primary food source, marmots, are often directly associated with modified areas and man-made habitat features such as rock piles (Weir and Almuedo 2010). Measures presented in this Plan associated with restoration of natural vegetation and soil characteristics (*e.g.*, compaction) on the Project Footprint are expected to reduce effects to habitat attributes that support badger prey populations. Although typical prey species may experience displacement or increased risk of mortality during construction activities, regional prey abundance is unlikely to be affected as a result of Project construction.

Sensory disturbance during Project construction may displace badgers temporarily, causing changes in movement patterns or habitat use. Given the linear and progressive nature of pipeline construction activities, sensory disturbance is expected to be short-term and localized. Indirect disturbance as a result of short-term sensory disturbance and resultant reduced habitat effectiveness is expected to be negligible

given scheduling of construction considers sensitive periods for American badger and appropriate setbacks will be implemented where active burrows are found.

Temporary barriers to movement may also occur during construction as a result of soil storage berms, open trench, strung pipe and vehicle or equipment traffic. Short-term changes in movement (avoidance) associated with pipeline construction will be reduced with the implementation of mitigation measures such as maintaining a tight construction spread and constructing the pipeline in a well-organized and efficient manner to limit the duration of sensory disturbance, leaving gaps in set-up and welded pipe and limiting the length and duration of time the trench is left open to reduce short-term barriers to movement. The Project will not create structures that would affect habitat connectivity or create long-term barriers to badger movement.

Friable soils suitable for burrowing and adequate prey availability are key badger habitat components, and burrows influence other aspects of badger life history (Apps *et al.* 2002, BC Ministry of Water, Land and Air Protection [BC MWLAP] 2004, Weir *et al.* 2003). Research on badgers in the interior region of BC found that badger habitat selection was positively associated with glaciolacustrine and glaciofluvial parent materials, Brunisols and Regosols, soils with sandy loam textures and open range, agricultural habitats and linear disturbances (Apps *et al.* 2002). In general, badger occurrence is better predicted from preferred soil conditions and prey availability, rather than specific habitat types (COSEWIC 2012) or altitudinal gradients (Newhouse 1999). A study of badger burrow distribution in BC found that most (>75%) were within 50 m of an area that Columbian ground squirrels used, and within 50 m of a road (Newhouse 1998). Considering these key components of badger habitat, soil handling procedures as well as minimizing disturbance to badger burrows are key components of this Plan. As discussed above, although Project construction may temporarily displace prey populations, prey abundance is unlikely to be affected by the Project.

Three types of badger burrows are used throughout the year: summer, maternal and winter burrows (Symes 2013). Burrows may be re-used seasonally or annually, and as such, it is often difficult to distinguish between active and inactive burrows. Summer burrows tend to be shallower and in more open habitats suitable for foraging (Symes 2013). As badgers have larger home ranges in summer (Hoodicoff *et al.* 2009), these burrows may be re-used less frequently and a new den may be used each day (Rahme *et al.* 1995). Maternal burrows (*i.e.*, burrows utilized to rear kits) are used for extended periods of time, have larger soil fans (larger soil fans are typically present after the maternal den has been in use for approximately 1 month), tend to be located in areas with increased overhead cover and are more often associated with roots, stumps and coarse woody debris (Symes 2013). Badgers typically mate in July or August, and birth occurs the following year in the maternal burrow between late-March to early-April (BC MWLAP 2004). Badger kits typically disperse by mid-July and maternal burrows are no longer active. Winter burrows have similar characteristics to maternal burrows (larger soil fan, associated cover and structural elements) and may be used for extended periods of time in the winter. Generally, badgers use more than one winter burrow over a season (typically two to three burrows), and tend to be nocturnally active throughout the winter (Symes 2013). The movements of female and male badgers during the winter decrease between 80-94% compared to summer movements (Symes 2013). During the winter, badgers may go into torpor (*i.e.*, a state of decreased physiological activity) and the length and frequency of torpor varies considerably between individuals (COSEWIC 2012, Newhouse 1997, Symes 2013). The onset of torpor occurs in January, and coincides with the coldest months of the year (Symes 2013). Project construction activities have the potential to increase mortality risk to badgers through disturbance of active burrows, and other mechanisms (*e.g.*, collisions with vehicle traffic on the right-of-way and access roads). Measures such as pre-construction surveys to identify active burrows, scheduling of clearing and construction activities to avoid sensitive periods such as breeding, and adhering to Project traffic speed limits have been incorporated into this Plan to reduce the Project's increased risk of mortality to badgers.

3.2 Project Interaction

Information on the specific components of the Project Footprint as defined in Section 1.1 (temporary construction lands and infrastructure, pipeline construction footprint, reactivation, facilities, access roads, contingency alternate routes and variances) and their interaction with American badger early draft critical habitat is provided below (note, the spatial area is not required for early draft critical habitat). This

information is specific to early draft critical habitat provided by ECCC (currently a 10 km x 10 km grid), and should not be interpreted as critical habitat (*i.e.*, some locations may not possess the biophysical attributes of critical habitat). Further detail on the biophysical attributes of critical habitat for American badger is provided in Section 3.3.2.

Temporary Construction Lands and Infrastructure

One camp site option (Clearwater Camp Old Mill Site), one camp/office and yard site option (Clearwater McMahon Camp, Office and Yard)) and one office/yard site option (Kamloops Office and Yard") associated with temporary construction lands and infrastructure are located within early draft critical habitat for American badger identified by ECCC (EC 2014a). The Clearwater Camp Old Mill Site is located within a previously disturbed area with existing roads and remnant treed areas. The Clearwater McMahon Camp, Office and Yard is located within agricultural land. The Kamloops Office and Yard is located within a previously cleared and disturbed area.

Additional site options associated with temporary construction lands and infrastructure are located more than 1 km from the pipeline route. The early draft critical habitat mapping provided by ECCC (EC 2014a) was limited to a 1 km buffer on either side of the pipeline route, therefore, in the absence of ECCC mapping outside of this 1 km buffer, Trans Mountain cannot determine the interaction of all temporary construction lands and infrastructure within American badger early draft critical habitat.

Pipeline Construction Footprint

The pipeline construction footprint crosses approximately 119 km of early draft critical habitat as provided by ECCC from KP 704.9 to KP 764.6 and KP 806.5 to KP 865.8. As noted, this entire length is not considered critical habitat. Trans Mountain's approach to inform and focus mitigation and monitoring for American badger is provided in Sections 4.0 (Wildlife Field Work) and 7.0 (Monitoring).

Reactivation

Reactivation workspace associated with the Darfield to Black Pines reactivation segment and Black Pines pump station are located in early draft critical habitat for American badger. The full extent of interaction with reactivation segments is not known in the absence of the early draft critical habitat mapping.

In the absence of the ECCC mapping, Trans Mountain cannot determine the interaction of the reactivation segments with early draft critical habitat for American badger.

Facilities

Four facilities are located within the area mapped by ECCC as early draft critical habitat for American badger. Work on three facilities (*i.e.*, Blackpool, Darfield and Kamloops Pump Stations) will be contained within the existing footprint and no new disturbance is planned, while the Black Pines Pump Station is a new facility and is within a previously disturbed area with few trees.

Access Roads

Trans Mountain has made all reasonable efforts to utilize existing roads within early draft critical habitat for American badger to access the Project and limit new access construction. Access to most of the Project Footprint will be via existing roads that either cross or are located adjacent to the Project Footprint. Existing linear corridors (*e.g.*, pipeline rights-of-way, transmission lines and fibre optic line rights-of-way), as well as the pipeline construction footprint will also be used as access. New temporary access roads and upgrades to existing access roads are necessary to allow equipment, vehicles and emergency response to safely reach the Project Footprint. Within early draft critical habitat for American badger, access requirements for the Project include:

New Temporary Access

- 16 segments ranging from 8 m to 441 m in length.
- Many of these roads are small connectors from an existing secondary road to the Project Footprint primarily to facilitate construction, and will be restored post-construction.

Access Roads that Require Upgrades

- 118 segments ranging from 6 m to 3,571 m in length.
- Upgrades to existing access roads are required to allow equipment, vehicles and emergency response to safely reach the Project Footprint. Many of these roads will only require grading and/or widening of travel surfaces where necessary to allow safe transport of Project vehicles and equipment and for the installation of temporary water crossing structures (where necessary).

This is based on Project road information available as of April 2016. Trans Mountain is continuing to refine access roads for the Project and any changes will be reviewed in relation to early draft critical habitat.

Contingency Alternate Routes

The Raft River Alternate is located within early draft critical habitat for American badger. The preferred primary crossing method (HDD) does not support an open cut contingency crossing method, therefore an alternate open cut contingency alignment has been identified. The contingency alternate will be used only in the event the HDD is unsuccessful. An update on potential Project effects on American badger will be provided to the NEB in the event the Raft River Alternate is required.

Variances

The Westsyde Road variance is located within early draft critical habitat for American badger. The variance does not result in revisions to Project interaction with American badger early draft critical habitat.

3.3 Regulatory Context

This Plan was developed in consideration of current regulatory policies and guidance. Trans Mountain will continue to work with Responsible Government Authorities to align this Plan with provincial and federal policy.

3.3.1 Provincial Regulatory Policy and Guidelines

A summary of key provincial regulatory policy and guidance is provided below.

Recovery Strategy for the Badger (*Taxidea taxus*) in British Columbia

The provincial Recovery Strategy was prepared by the BC Badger Recovery Team in December 2016 (BC Badger Recovery Team 2016). The provincial Recovery Strategy outlines a recovery (population and distribution) goal which is to maintain or increase the populations to levels sufficient to ensure persistence over time, and to maintain the distribution of the species across the known range in BC (BC Badger Recovery Team 2016). To attain this goal, the provincial Recovery Strategy outlines seven objectives: to protect American badgers and their habitat, to more accurately estimate American badger abundance, to better understand prey ecology, history, and distribution, to better understand distribution of preferred soil associations, to improve understanding of genetic structure of American badgers in the province, to improve knowledge of American badger distribution and abundance in poorly documented regions, and to increase public awareness and appreciation of American badgers in BC (BC Badger Recovery Team 2016). The provincial Recovery Strategy provides broad recommended approaches to meet these recovery objectives that include traffic control, grassland and open forest restoration, and reducing habitat fragmentation/increasing connections between habitats.

Conservation Strategies for North American Badgers in the Thompson and Okanagan Regions

The Conservation Strategies for North American Badgers in the Thompson & Okanagan Regions - Final Report for the Thompson-Okanagan Badger Project includes habitat conservation guidelines that broadly support the recovery objectives outlined in the provincial Recovery Strategy. These strategies focus on increasing survival and recruitment within the population and ensuring suitable habitat for badgers (Weir *et al.* 2003).

Accounts and Measures for Managing Identified Wildlife – Badger (*Taxidea taxus jeffersonii*)

The Accounts and Measures for Managing Identified Wildlife – Badger (*Taxidea taxus jeffersonii*) species account provides an overview of the general biology and ecology of the badger, current threats facing the BC badger population, and identified wildlife provisions that serve as guidelines for mitigation (BC MWLAP 2004). These provisions include maintaining high value habitat for badgers, maximizing connectivity between these habitats, maintaining habitats that support a prey base and minimizing urbanization, agriculture, other developments and road densities.

3.3.2 Federal Regulatory Policy and Guidelines

American badger is listed as Endangered on Schedule 1 of SARA (GoC 2017) and by COSEWIC (2017). There is no federal recovery strategy posted for this species to the Species at Risk Public Registry, although ECCC noted that one should be expected in 2016-2017 (EC 2015). ECCC provided to Trans Mountain a summary of the biophysical attributes of critical habitat and draft characterization of activities likely to result in the destruction of critical habitat, as well as mapping of early draft critical habitat for American badger using a 10 km grid (EC 2014a,b). The biophysical attributes of early draft critical habitat for American badger within its range are:

- habitats with soil types that allow for digging (both in pursuit of prey and to establish dens) (*i.e.*, Brunisols, Chernozems and Aeolian soil types with Glaciolacustrine, Lacustrine and Fluvial parent materials and low coarse fragments);
- non-forested habitats that support an abundance of small-mammal prey:
 - non-forested habitat types that support small-mammal prey for badger: natural grasslands, pasture, open forested sites, as well as recently cleared areas and burned sites;
 - prey: primarily Columbian ground squirrels (*Urocitellus columbianus*), but also yellow-bellied marmots (*Marmota flaviventris*), northern pocket gophers (*Thomomys talpoides*), voles (*Microtus* spp.) and muskrat (*Ondatra zibethica*); and
- continuous habitat and/or corridors to facilitate necessary movements (*i.e.*, dispersal to new prey areas, finding mates) that are not impeded by anthropogenic barriers such as major roadways (where those roadways lack safe passage features) and large developed areas. These habitats may be non-forested and/or may represent non-characteristic habitats such as forested and alpine areas.

3.3.3 Alignment with Available Regulatory Policy and Guidance

Alignment of this Plan with the strategies and goals of the provincial Recovery Strategy and other guidance documents is achieved through a focus on reducing Project disturbance to soils and vegetation that provide habitat for badger and their prey to the extent possible and incorporating several guidelines for mitigation into this plan (*e.g.*, limiting new road development to the extent practical, avoiding above-ground structures that would inhibit habitat connectivity, mitigating risk of badger mortality as a result of Project activities, and restoring vegetation and soil habitat characteristics within the Project Footprint).

4.0 WILDLIFE FIELD WORK

American badger dens/burrows and evidence of badger activity (*i.e.*, fresh digging and tracks) were recorded in 2013, 2014 and 2015 consecutively with other wildlife field work, where this field work occurred in areas of suitable badger habitat (*i.e.*, incidental observations are recorded during all wildlife work including mammal diggings, burrows, tracks, wildlife observations). Wildlife field crews were aware of the conservation status of American badger; therefore, wildlife habitat features such as burrows and small mammal colonies were of particular interest. In the summer of 2014 and 2015, wildlife field crews also collected preliminary information on the presence of the biophysical attributes of critical habitat (*i.e.*, habitats with soil types that allow for digging; non-forested habitats that support an abundance of small-mammal prey; and continuous habitat and/or corridors to facilitate necessary movements). This work was completed at a limited number of sites and was found to be a challenging exercise (as described further below).

During wildlife field work in 2013, evidence of badger activity was observed at 12 locations within 200 m of the Project Footprint, between KP 816.9 to KP 818.0, near KP 824.1, and between KP 854.4 to KP 858.7. Evidence of badger activity included the presence of badger burrows, fresh digging, and tracks. Qualified wildlife biologists with experience identifying badger burrows and activity, determined that 11 of 12 burrows did not show evidence of recent use. One active burrow consisting of a single opening was observed in open grassland habitat, located approximately 61 m southeast of the Project Footprint at KP 856.4. During wildlife field work in 2014, evidence of badger activity was observed at two locations. One burrow was observed and showed signs of recent excavation in open grassland habitat located approximately 103 m north of the Project Footprint at KP 851.4. The second burrow, located near KP 824.0, did not have evidence of recent use. Badger activity or active burrows were not observed during the wildlife field work in 2015. Incidental observations of marmot activity were recorded near KP 817.1 and KP 853.1. No large ground squirrel colonies were observed during the field work from 2013 to 2015, however, smaller groups (approximately five individuals) were recorded in selected areas along the pipeline route.

During other discipline field work in October 2016, potential badger burrows were observed within the northwest corner of the Black Pines Pump Station site. No badgers were observed at time of the field work and occupancy or species use of the burrows could not be determined.

A review of the results of the field work and discussions with field crews determined that the identification and delineation of the biophysical attributes of critical habitat for American badger is challenging due to the broad and somewhat subjective nature of the biophysical attributes. These challenges, as well as the extensive length of Project overlap with early draft critical habitat for American badger (*i.e.*, 119 km), were discussed with BC Ministry of Forests, Lands and Natural Resource Operations (BC MFLNRO) (Appendix A, Table A-2). Trans Mountain determined the most relevant approach to identify areas for mitigation and monitoring for American badger was to focus on areas that interact with the Project that have higher potential to support the biophysical attributes of critical habitat, and to further target identification and mitigation for active badger burrows.

A step in this exercise was to refine the area of early draft critical habitat provided by ECCC (currently a 10 km x 10 km grid). This was completed as a desktop exercise. Guided by the biophysical attributes of critical habitat (see Section 3.3.2), as well as the ecology of American badger and their primary prey species (see Section 3.1), a detailed review of aerial imagery, field work results (*e.g.*, wildlife and vegetation), BC CDC data and Terrestrial Ecosystem Mapping (TEM) was conducted. The focus was on identifying non-forested habitats (*i.e.*, natural grasslands, pasture, open forested sites, recently cleared areas, burned sites) that have higher potential to support small mammal prey and American badger. This method was discussed with BC MFLNRO (Appendix A, Table A-2). Trans Mountain utilized a conservative approach to narrow the area of focus within early draft critical habitat. The Project Footprint within early draft critical habitat was delineated into areas with high tree cover (forested) and low tree cover (open habitat). Weir *et al.* (2003) noted that burrows were associated with approximately 4% tree cover on average (standard deviation of 8%). Therefore, Trans Mountain used 15% tree cover as a conservative guideline for open habitat, including pasture, grassland and open forest, in which badger burrows are likely to occur. The remaining variables associated with badger burrow locations (soil characteristics, slope, prey density) were assumed to have the potential to be present/suitable within these areas of open habitat. Disturbed, non-vegetated areas, and areas that receive frequent disturbance by human activity (*e.g.*, cropland, gravel and paved surfaces) were removed. The resulting suitable open

habitat areas were overlaid with the results of discipline field work (*i.e.*, wildlife and vegetation surveys) to further refine the narrowed area.

This exercise identified specific areas of focus that included the Lac du Bois Grasslands Protected Area, as well as areas of natural grasslands or pasture that wildlife field crews also noted as having higher potential to support small mammal prey and American badger. Trans Mountain is also in the process of determining whether the aerial patrols that are conducted along their existing Trans Mountain Pipeline (TMPL) right-of-way can be used to document observations of burrowing mammal activity, specifically American badger, yellow-bellied marmots and Columbian ground squirrels, prior to clearing and construction activity. The use of aerial surveys to identify dens is outlined in Inventory Methods for Medium-Sized Terrestrial Carnivores: Coyote, Red Fox, Lynx, Bobcat, Wolverine, Fisher and Badger (BC Ministry of Environment, Lands and Parks 1999), and was suggested by BC MFLNRO during consultation (Appendix A, Table A-2). This may serve to further focus areas of interest for mitigation and monitoring for American badger.

At this time, the areas of interest for American badger are listed below and includes 40.8 km of the early draft critical habitat identified by ECCC:

- KP 707.9 to KP 708.7;
- KP 708.8 to KP 709.0;
- KP 723.8 to KP 724.0;
- KP 757.0 to KP 757.5;
- KP 757.7 to KP 758.0;
- KP 761.3 to KP 763.8;
- KP 806.5 to KP 807.2;
- KP 807.7 to KP 808.4;
- KP 814.0 to KP 814.7;
- KP 816.0 to KP 816.5;
- KP 817.0 to KP 817.4;
- KP 818.6 to KP 819.9;
- KP 822.0 to KP 823.3;
- KP 824.5 to KP 825.0;
- KP 825.3 to KP 832.0;
- KP 832.3 to KP 840.8;
- KP 843.5 to KP 846.5;
- KP 847.5 to KP 847.7;
- KP 848.7 to KP 852.9;
- KP 853.1 to KP 858.2;
- KP 858.3 to KP 858.6;
- KP 858.7 to KP 859.3;
- KP 859.5 to KP 860.1; and
- KP 860.3 to KP 861.4.

4.1 Preconstruction Badger Den Sweeps

Within areas of interest identified for American badger, pre-construction sweeps for active American badger burrows will be conducted using guidance from the Inventory Methods for Medium-sized Territorial Carnivores: Badger (BC MOE 2007). Preconstruction sweeps will be influenced by the season of clearing and construction and will be discussed with BC MFLNRO. As part of the Environmental and Compliance Education Program (Section 4.3 of the Pipeline Environmental Protection Plan [EPP]), training will include the identification of active and inactive badger burrows for those working in areas with potential to encounter them.

Preconstruction sweeps will be conducted from April 1 to July 15 to identify active maternal and summer dens. Maternal dens are utilized for longer periods of time with young typically dispersing by mid-July. Summer dens are used for shorter durations (in some cases only a day). Winter dens are difficult to determine occupancy, therefore, if clearing and construction activities are scheduled to be initiated in the winter when there can be snowfall accumulation, a pre-construction survey in areas with known potential to support badgers will be conducted prior to snowfall to identify potential dens that have evidence of recent use. All badger dens and diggings will be recorded (Universal Transverse Mercator [UTM] coordinate and mapped). If a potential (occupied or unoccupied) den is identified on the Project Footprint, Trans Mountain will review whether this area can be pre-cleared to discourage overwintering badgers. If this is not possible and activity will occur in the winter, all recorded locations of potential dens will be revisited prior to activity to determine if they are being used. This strategy was discussed with BC MFLNRO (see Section 3.2.2 in Appendix A). Badgers are active at times during the winter and winter burrows may be identified by excavated soil and tracks (BC MOE 2007). Depending on the season and site-specific circumstance, the appropriate mitigation measure provided in Section 5.3 (Table 2) will be implemented.

5.0 MITIGATION

Project planning and mitigation development followed the mitigation hierarchy of avoid, minimize and restore on-site as described in the following sections. Planning support and development of site-specific mitigation and restoration measures is based on information available to date (e.g., field surveys, consultation with BC MFLNRO, mapping provided by ECCC). Collection of additional information prior to construction (e.g., additional field surveys, critical habitat mapping updates) is ongoing and will be used to inform mitigation as necessary. This Plan will be included as part of the Environmental Management Plans (Section 6.0 of Volume 6 of the Environmental Plans).

During Project planning, all possible mitigation options were considered in light of known constraints and limitations associated with site characteristics, existing disturbance and activities, regulatory requirements and recommendations, and construction methods. The consideration of these measures and their feasibility are discussed below.

5.1 Avoid

During the pre-construction phase, available strategies to avoid adverse effects to critical habitat include routing and siting, and scheduling. The strategies of avoidance that have been considered in Project planning are described below.

5.1.1 Project Routing

The pipeline corridor and route selection process for the Project is described in the Application (Section 2.8 of Volume 4A) (Trans Mountain 2013). In general, the primary objective was to locate the pipeline contiguous to, and share construction workspace with, the existing TMPL right-of-way wherever possible. Given the coarse nature of early draft critical habitat provided by ECCC (currently a 10 km x 10 km grid), routing to avoid early draft critical habitat was not feasible, nor would it achieve with the primary routing objective to align the pipeline route contiguous to the existing TMPL. Within early draft critical habitat for American badger, the pipeline route parallels the existing TMPL right-of-way for approximately 91.2 km (77%).

The route selection process for the Project is complete at this time. Trans Mountain has implemented measures to reduce clearing by paralleling the existing TMPL right-of-way, as well as reconfiguring and reducing TWS where feasible. In addition, refinement and narrowing of the pipeline construction footprint was completed through the pre-construction planning and routing process. Through several iterations of the pipeline construction footprint, the standard width of the pipeline right-of-way was reduced to 40-45 m wide (with extra temporary workspace allotted as required) which includes the existing TMPL and other utility rights-of-way where they are paralleled. Narrowing to this standard width was applied to the entire length of the pipeline route in an effort to reduce overall disturbance of the Project outside of critical habitat as well as within. Narrowing beyond this width can compromise construction progress, increase the duration of construction, and add new areas of temporary workspace to accommodate equipment and materials. As indicated, Trans Mountain's focus is to identify and avoid active badger burrows. This will be accomplished through Project scheduling (see Section 5.1.2 below), pre-construction surveys and minor modifications to TWS requirements as needed if an active burrow is found during clearing or construction.

5.1.2 Project Scheduling

Clearing and construction is recommended to commence in the period from mid-summer to fall (July 15 to October 15) since this is when badgers are most active (see Appendix A, Table A-2). In the event that clearing or construction is scheduled to commence outside this period (i.e., mid-October to mid-July), in areas with high suitability to support badgers, a pre-construction survey to identify any active badger dens will be completed. Depending on scheduling of the Project activity, pre-construction surveys will be completed in March/early April to identify active maternal dens or prior to snowfall (late fall) to identify potential winter dens. Between July 15 to October 15 badger dens/excavations are utilized for foraging or for short-term residency. Inactive/unoccupied burrows identified between July 15 to October 15 can be filled with spoil already excavated at the entrance to the burrow and covered with an immovable object to prevent the burrow from becoming occupied. In the event a burrow is determined to be occupied or identified as a potential winter den, the recommended mitigation in Table 2 would be implemented.

Project scheduling has considered the recommended timing window for badger to the extent possible while balancing consideration of other constraints applicable to Project scheduling in these areas. These constraints include a multitude of factors, such as access requirements, landowner agreements, contractor and equipment availability, suitable progressive linear construction methods, anticipated seasonal soil moisture conditions, and other sensitive timing windows for wildlife, grasslands and fish that influence construction timing.

5.2 Minimize and Restore On-site

In addition to routing and siting, as well as Project scheduling, Trans Mountain considered reasonable alternative measures to avoid and reduce Project effects on critical habitat. Through routing and siting, the Project Footprint has been reduced to the extent feasible. Additional Project planning considerations during the pre-construction phase provided the opportunity to further minimize Project effects and facilitate habitat restoration following Project construction. Input on Project planning and design was reviewed and discussed with Trans Mountain engineers, Construction Supervisors, the Lead Environmental Inspector and Kinder Morgan Canada Inc.'s (KMC) operations staff to determine the applicability and feasibility of alternative measures to avoid and reduce Project effects on critical habitat. An example of additional planning considerations includes adjusting the configuration of TWS to avoid or reduce clearing of vegetation. Criteria used to evaluate the configuration of TWS includes but is not limited to, terrain conditions (slopes), surface/subsurface conditions (rock, depth of soil, etc.), construction access requirements, materials storage needs and construction methods (e.g., bends require additional space).

Project planning within early draft critical habitat for American badger has included efforts to reduce the area of the Project Footprint to the extent possible (e.g., narrowing of the pipeline construction footprint, using the existing TMPL right-of-way as workspace to reduce clearing requirements). In addition, many of the mitigation measures included in the Pipeline EPP (see Volume 2 of the Environmental Plans) will serve to reduce disturbance during clearing and construction. Although Project Footprint planning is complete, other measures to be implemented to further minimize disturbance include:

- measures to reduce ground disturbance during construction (e.g., limiting grading and grubbing where practical and safe to do so, reducing disturbance to vegetation and root systems by cutting and mowing shrubs to ground level); and
- implementation of proper soil handling techniques and soils contingency plans to prevent admixing and compaction of soils and erosion.

The implementation of mitigation measures to ensure proper soil handling and the prevention of soil admixing and compaction are particularly important to maintain soil characteristics that allow for digging (for badgers and their primary prey species). Additional measures that will serve to reduce disturbance during clearing and construction are included in Table 2.

The objective is to restore habitat similar to pre-construction conditions and in a manner that is consistent with, and supports, the restoration of the biophysical attributes of critical habitat over time. For American badger, restoration measures will focus on revegetating open habitats and maintaining soil characteristics that allow for digging to support badger foraging and burrowing as well as prey populations.

The revegetation strategy for those areas identified as having higher suitability to support American badger and the biophysical attributes of critical habitat (refer to Section 4.0 for preliminary areas) is detailed within the Reclamation Management Plan (Section 9.0 of Volume 6 of the Environmental Plans), the Grasslands Survey and Mitigation Plan (Section 5.0 of Volume 6 of the Environmental Plans) (where native grasslands occur in areas that support badgers), BC Parks Reclamation Management Plan (specific to the Lac du Bois Grasslands Protected Area, Section 9.0 of Volume 6 of the Environmental Plans) and the Weed and Vegetation Management Plan (Section 5.0 of Volume 6 of the Environmental Plans). Though revegetation measures will be implemented broadly along the Project, additional efforts, such as rooted grass and shrub plantings, will be focused within native grassland areas that overlap with early draft

critical habitat. The following revegetation strategies or combination thereof will be used, dependent on existing land use, landowner agreements on privately owned lands and site-specific conditions:

- seeding with a native grass mix and short-lived cover crop;
- rooted grass and shrub plantings (within native grasslands); and
- weed management.

Native vegetation will be allowed to revegetate, and a short-lived cover crop will be used to minimize soil erosion and weed establishment in areas that are prone to these issues. Native grass seed mixes (containing pioneer and later successional native grasses, where available) will be seeded and rooted shrubs will be planted. Areas within the Lac du Bois Grasslands Protected Area will also receive plantings of rooted grasses and shrubs that are propagated from locally collected seed. Only low-growing species (herbaceous vegetation, low shrubs) will be used for revegetation within the pipeline easement (generally 18 m wide) immediately over the buried pipes to maintain required operational access and visibility for monitoring the operational pipeline. Temporarily disturbed areas, including TWS, will not be needed for ongoing operation of the pipeline and therefore will be reclaimed to allow for growth of both seeded and naturally regenerating native woody species over time (width of TWS generally ranges between 22 m and 27 m). Further detail regarding the criteria for implementation of each revegetation strategy and seed mixes are provided in the Reclamation Management Plan (Section 9.0 of Volume 6 of the Environmental Plans), Grasslands Survey and Mitigation Plan (Section 5.0 of Volume 6 of the Environmental Plans) (where native grasslands occur within critical habitat) and BC Parks Reclamation Management Plan (specific to the Lac du Bois Grasslands Protected Area, Section 9.0 of Volume 6 of the Environmental Plans). Weeds will be managed along the length of the pipeline route as described in the Weed and Vegetation Management Plan (Section 5.0 of Volume 6 of the Environmental Plans) and Integrated Vegetation Management Plan (KMC 2016).

The potential for time lag between when Project effects occur and when mitigation and habitat restoration measures are implemented and fully functional has been considered in the development of this Plan. Project effects associated with sensory disturbance and barriers to movement for badger (e.g., habitat connectivity and movement) will be limited to the construction phase of the Project and are expected to be short-term in duration and adequately avoided with the implementation of mitigation measures related to scheduling and protection of active burrows. The Project Footprint is not expected to impede badger movement or habitat connectivity following clean-up, however there is potential for a time lag associated with prey re-colonization of the Project Footprint following clean-up and initial reclamation. Excessive soil compaction may also limit the ability of badger and prey species to burrow within the Project Footprint following construction; however, compaction testing conducted during construction is expected to identify compaction issues prior to topsoil replacement to allow for immediate implementation of corrective actions (e.g., subsoil tilling). As described in Section 3.1, prey species use of disturbed sites is closely tied to development of suitable vegetation communities. To reduce time lag associated with revegetation, reclamation planning and preparation (e.g., seed collection, propagation) will occur prior to and during construction activities to limit the period between final clean-up and reclamation implementation. Measures to reduce ground disturbance during construction (i.e., limiting grading and grubbing where practical and safe to do so, reducing disturbance to vegetation and root systems by cutting and mowing shrubs to ground level) will preserve intact root systems and seed bed to facilitate rapid regeneration of vegetation following construction. Time lags will be further reduced by implementation of corrective measures as soon as feasible if measurable targets are found to be underperforming. Habitat enhancement measures for yellow-bellied marmots (e.g., placement of rock piles in select locations within TWS where marmot burrows/colonies are identified prior to construction) is expected to further encourage recolonization of the Project Footprint by this species.

5.3 Mitigation and Habitat Restoration Measures

The measures in Table 2 describe mitigation and habitat restoration measures that will be applied to those areas identified as having higher suitability to support American badger and the biophysical attributes of critical habitat (refer to Section 4.2). Table 2 includes applicable mitigation measures from the Pipeline EPP, as well as new measures. Selected measures from the Pipeline EPP are repeated in Table 2 for emphasis and to demonstrate their relevance specific to areas where American badgers may occur. The standard Pipeline EPP measures will be applied to the length of the route within early draft

critical habitat, including areas that are not targeted for surveys. The measures in Table 2 consider available regulatory guidelines and best management practices (see Section 3.3), as well as consultation with Appropriate Government Authorities and species experts (Appendix A, Table A-2). The measures repeated from the Pipeline EPP are identified in Table 2 with a reference to the Pipeline EPP section where the measure can be found. This Plan will be included as part of the Environmental Management Plans (Section 6.0 of Volume 6 of the Environmental Plans) and summarized and updated in the Resource Specific Mitigation Tables (Section 4.0 of Volume 7 of the Environmental Plans) associated with the Pipeline EPP and Environmental Alignment Sheets. The Construction Manager, in conjunction with an Environmental Inspector, will ensure that the protection measures are implemented.

The retention biophysical features/attributes of critical habitat are an important consideration. Figure 1 provides a guide to inform decisions and the circumstances that may be encountered. Decisions made regarding the implementation of site-specific mitigation and habitat restoration measures and their final locations will be tracked by the Environmental Inspector and the Construction Manager through a compliance tracking and reporting system and reported in Post-Construction Environmental Monitoring (PCEM) reports (see Section 7.4).

TABLE 2

**MITIGATION AND HABITAT RESTORATION MEASURES FOR AREAS
WITH THE BIOPHYSICAL ATTRIBUTES OF CRITICAL HABITAT**

Activity/Concern	Mitigation Measures [EPP Reference]
<i>Education and Awareness</i>	<ol style="list-style-type: none"> Controlled copies of the Pipeline EPP and associated environmental documents are required to be reviewed by key construction and Contractor personnel prior to construction and will be available to all key Contractor staff members during construction (see the Compliance Management Plan in Volume 10 of the Environmental Plans). Report observations of species of concern immediately to an Environmental Inspector. The Environmental Inspector will record the location in the daily reports and locate and mark sightings for future reference on the Environmental As-Built Alignment Sheets. [Section 7.0 General Pipeline Construction Mitigation Measures] Implement the Environmental and Compliance Education Program as described in the Compliance Management Plan in Volume 10 of the Environmental Plans. This program will include information on wildlife species at risk including identification of badger burrows for those working in areas with potential to encounter them. An Environmental Inspector is responsible for monitoring compliance with environmental and socio-economic commitments, undertakings and conditions of permits and approvals, as well as applicable environmental legislation, Trans Mountain's policies, procedures, and industry-accepted standards. An Environmental Inspector may designate responsibility for environmental and socio-economic compliance monitoring in certain cases based on the nature of the activity and the availability of appropriate alternative personnel (e.g., Activity Inspector) (see the Compliance Management Plan in Volume 10 of the Environmental Plans). An Environmental Inspector will organize on-site meetings in consultation with the Construction Manager or designate and, as the need arises, to address resource-specific issues, as well as review construction methodologies (see the Compliance Management Plan in Volume 10 of the Environmental Plans).
<i>Consultation</i>	<ol style="list-style-type: none"> An Environmental Inspector will liaise with Appropriate Government Authorities and the Aboriginal Monitors assigned to the Project in co-operation with the Construction Manager or designate and the Project Environmental Manager (see the Compliance Management Plan in Volume 10 of the Environmental Plans).

TABLE 2 Cont'd

Activity/Concern	Mitigation Measures [EPP Reference]
<i>Scheduling</i>	7. Commence activity during the least risk window of July 15 to October 15 when American badgers are most mobile. Prior to the commencement of Project activities, Wildlife Resource Specialists will conduct pre-construction sweeps in the areas identified to search for active dens from April 1 to July 15 to identify active maternal and summer dens, and from July 15 to onset of snowfall to identify active summer dens and dens that may be used during winter. Inactive dens identified on the Project Footprint between July 15 to October 15 will be filled in with spoil already excavated at the entrance to the dens and covered with an immovable object to prevent the den from becoming occupied.
<i>Species Disturbance During Construction</i>	<p>8. In the event an active den is identified, mitigation will consider the site-specific circumstances (e.g., season and type of activity, location of den). The recommended setback is 500 m for a maternal den and 50 m for a summer or winter den. A reduced setback with on-site monitoring, as necessary, may be used depending on site specific circumstances (e.g., adequate barrier exists between active den and Project activity or activities can be modified in a way that effectively reduces sensory disturbance from the Project) and discussion with BC MFLNRO. The mitigation will be approved by the Environmental Inspector with guidance from a Wildlife Resource Specialist.</p> <p>9. Implement the Wildlife Species of Concern Discovery and Encounter Contingency Plan (see Appendix B of the Pipeline EPP [Volume 2 of the Environmental Plans]). Mitigation will vary depending on the site-specific circumstance and time of year and will be approved by the Environmental Inspector with guidance from a Wildlife Resource Specialist.</p>
<i>Reduce Habitat Loss</i>	<p>10. Confine all clearing/mowing within the staked/flagged boundaries. Clear vegetation from only those areas essential for construction. Adhere to clearing/mowing restrictions associated with riparian buffer areas, and in areas where sensitive environmental features have been identified as outlined on the Environmental Alignment Sheets (Volume 8 of the Environmental Plans). [Section 8.0 Survey and Clearing]</p> <p>11. Ensure construction activities do not cause excessive rutting soil compaction or pulverization. Consider alternate soil handling measures and adhere to the measures outlined in the Wet/Thawed Soils Contingency Plan. [Section 10.0 Topsoil/Root Zone Material Handling and Grading]</p> <p>12. Install matting, geotextile, log corduroy or other material approved by an Environmental Inspector to allow traffic through localized areas of wet/thawed soils. Record the UTM coordinates at all locations where materials are installed to facilitate access. [Section 7.0 General Pipeline Construction Mitigation Measures]</p> <p>13. Initiate contingency measures in the Wet/Thawed Soils Contingency Plan (Appendix B of the Pipeline EPP) once one of the following indicators occurs:</p> <ul style="list-style-type: none"> • excessive rutting of topsoil/root zone material to the extent that admixing may occur; • excessive wheel slip; • excessive build-up of mud on tires and cleats; • formation of puddles; and/or • tracking of mud down the road as vehicles leave the pipeline construction footprint. [Section 7.0 General Pipeline Construction Mitigation Measures]

TABLE 2 Cont'd

Activity/Concern	Mitigation Measures [EPP Reference]
<i>Reduce Habitat Loss (cont'd)</i>	<p>14. If wet/thawed soil conditions warrant a corrective action, the decision to modify or alternatively shutdown the construction activity will be made by the Construction Manager in consultation with the Environmental Inspector as outlined in the Compliance Management Plan (Volume 10 of the Environmental Plans. [Section 7.0 General Pipeline Construction Mitigation Measures]</p> <p>15. Restrict construction traffic within the pipeline construction footprint as outlined in the Traffic and Access Control Management Plan prepared pursuant to NEB Condition 73. [Section 7.0 General Pipeline Construction Mitigation Measures]</p> <p>16. Retain sod and the vegetation mat if ground conditions are considered competent enough to support equipment traffic without rutting or mixing soils (<i>i.e.</i>, are frozen and are not expected to thaw before completion of the work) on lands with thick sod or vegetation layers (<i>e.g.</i>, grasslands, hay tame pasture), or that are matted where grading is not required. [Section 10.0 Topsoil/Root Zone Material Handling and Grading]</p> <p>17. Reduce grading along the pipeline construction footprint, where grading is not required to provide a safe working surface. This measure applies within riparian areas and where ground conditions are considered competent enough to support equipment traffic without rutting or mixing soils (<i>i.e.</i>, are either frozen, have competent sod or vegetation or are matted). [Section 10.0 Topsoil/Root Zone Material Handling and Grading]</p> <p>18. Limit grading on steep longitudinal slopes to the area needed to allow the safe and efficient passage of equipment, excavation of the trench and installation of the pipe. [Section 10.0 Topsoil/Root Zone Material Handling and Grading]</p> <p>19. Restrict root grubbing to areas where soil removal is necessary (<i>e.g.</i>, trench line and areas to be graded) to reduce surface disturbance and encourage re-sprouting/natural regeneration of trees and shrubs. [Section 8.0 Survey and Clearing]</p> <p>20. Where grubbing and grading are not necessary, salvage stumps for rollback and mow surface vegetation (<i>i.e.</i>, shrubs and small trees) to ground level to preserve topsoil/root zone material and establish a smooth working surface. [Section 8.0 Survey and Clearing]</p> <p>21. BC Park's soil handling requests will be accommodated if feasible within the Lac du Bois Grassland's Protected Area. Any locations where BC Parks has requested soil handling which differs from the planned method will be recorded (refer to Grasslands Survey and Mitigation Plan [Section 5.0 of Volume 6 of the Environmental Plans]).</p> <p>22. During clearing and construction, locations of yellow-bellied marmot burrows/colonies within the Project Footprint will be noted by the Environmental Inspector(s). Retain large rocks salvaged as a by-product of construction for use as a habitat enhancement feature in these locations.</p>
<i>Barriers to Movement During Construction</i>	<p>23. Maintain a tight construction spread (<i>i.e.</i>, stringing to backfilling) and construct the pipeline in an efficient manner to limit the duration of sensory disturbance to wildlife. [Section 7.0 General Pipeline Construction Mitigation Measures]</p>

TABLE 2 Cont'd

Activity/Concern	Mitigation Measures [EPP Reference]
<i>Traffic and Access Management</i>	<p>24. During construction, use flagging, staking, fences or signs to delineate the boundaries of the pipeline construction footprint, shooflies, facilities, temporary access roads, and environmental features of concern that require protection.</p> <p>25. Restrict construction traffic to the approved and marked pipeline construction footprint and approved access roads, avoiding areas that are marked and abiding by any restrictions on in/out privileges that are implemented in areas requiring special protection.</p> <p>26. Apply appropriate measures (e.g., signs, boundary markers, gates and fences) to ensure that Project vehicles remain on the designated access.</p> <p>27. Limit travel up and down the pipeline construction footprint and restrict traffic (e.g., prohibiting two-way travel) during the course of the work in sensitive environmental areas (e.g., native grasslands, riparian areas, wetlands, watercourses, critical habitat).</p> <p>28. Install and maintain signs, gates or other temporary barriers at potential access points to the pipeline construction footprint or temporary construction access to deter unauthorized access during the construction period.</p> <p>29. Existing access roads and trails are planned for use, where available and can be safely and efficiently used to transport personnel and equipment, rather than develop new access. [Section 9.0 Access Roads for Pipelines]</p> <p>30. Transport construction personnel to and from the Project Footprint by multi-passenger vehicle to limit the potential for vehicle/wildlife interactions. [Section 7.0 General Pipeline Construction Mitigation Measures]</p> <p>31. Establish speed limits, approved by Trans Mountain, and in compliance with provincial regulation, on the Project Footprint and access roads. Post signs stating the applicable speed limits for construction traffic. [Section 7.0 General Pipeline Construction Mitigation Measures]</p> <p>32. Deactivate and reclaim temporary construction access that does not have a third-party disposition to native vegetation or pre-construction land use. Implement access controls on deactivated temporary roads.</p>
<i>Weeds</i>	<p>33. Ensure that equipment arrives at ungraded construction sites clean and free of soil or vegetative debris. Inspect, verify, and document clean equipment. [Section 7.0 General Pipeline Construction Mitigation Measures]</p> <p>34. Flag areas identified as having high weed infestations prior to commencement of construction. Control weeds (<i>i.e.</i>, using proper application of chemical, mechanical or manual measures, or a combination of all) at locations identified within the pre-construction weed survey and on the Environmental Alignment Sheets (Volume 8 of the Environmental Plans) to a level that is consistent with current weed management practices on land adjacent to the Project Footprint to reduce the potential for weed infestations following construction. Mitigation measures to be implemented for weeds can be found in:</p> <ul style="list-style-type: none"> • Section 7.0 of the Pipeline EPP; • the Weed and Vegetation Management Plan (Section 5.0 of Volume 6 of the Environmental Plans); • the Agricultural Management Plan (Section 2.0 of Volume 6 of the Environmental Plans); and • the Biosecurity Management Plan (Section 2.0 of Volume 6 of the Environmental Plans). [Section 6.0 Pre-Construction Activities]

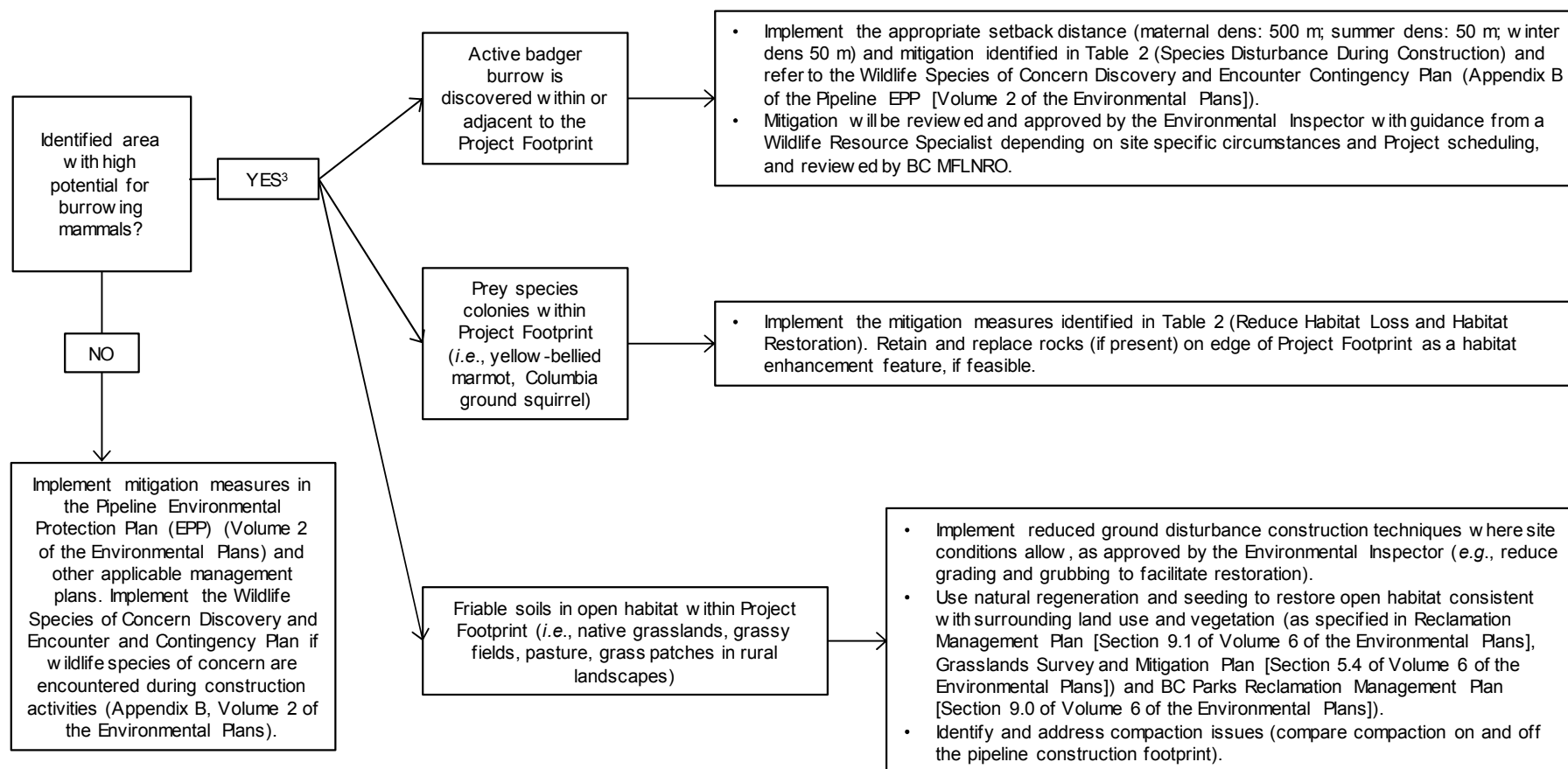
TABLE 2 Cont'd

Activity/Concern	Mitigation Measures [EPP Reference]
<i>Habitat Restoration</i>	<p>35. Replace grade material to a contour that will approximate the pre-construction contour, except where it is not safe to do so. When replacing sidehill or other graded areas is not practical due to the risk of slope failure, the Construction Manager, and a Geotechnical Resource Specialist will determine an appropriate grade. [Section 12.0 Backfilling]</p> <p>36. Avoid scalping of the vegetation mat on cleared, ungrubbed vegetation (e.g., riparian areas) as well as lands with a competent sod layer (e.g., tame pasture, hay lands and native grasslands) during backfilling. Use equipment (e.g., clean-up bucket) for final pass of backfilling, which will reduce scalping. [Section 12.0 Backfilling]</p> <p>37. Replace subsoil so that the level of compaction is sufficient to avoid future subsidence but does not exceed soil compaction levels found prior to construction or adjacent to the Project Footprint (i.e., soil compaction measures are consistent with adjacent undisturbed conditions with a target of <20% increase in compaction level on the Project Footprint). When replacing topsoil/root zone material, avoid track packing or compacting materials and replace in a manner that leaves the surface in a rough condition (i.e., textured) to reduce surface water runoff.</p> <p>38. Determine locations of subsoil compaction by comparing compaction levels on and off the pipeline construction footprint. Sites compared will be in close proximity and have similar drainage, soil moisture, aspect and land use.. [Section 13.0 Construction Clean-Up and Reclamation]</p> <p>39. Determine the extent of disturbance to native grasslands (e.g., compaction and rutting) and prepare the surface prior to seeding as per discussions with the Environmental Inspector or Reclamation Resource Specialist. [Section 13.0 Construction Clean-up and Reclamation]</p> <p>40. Rip compacted subsoils, where adjacent compaction levels are exceeded, on the pipeline construction footprint adjacent to the ditch line and along shoo-flies to a depth of 30 cm or the depth of compaction, whichever is deeper. If soils are moist, postpone decompaction of subsoils until soils dry to ensure that the measures are effective [Section 13.0 Construction Clean-up and Reclamation]</p> <p>41. Employ a subsoiler plow (e.g., Paratiller) along segments of the pipeline construction footprint adjacent to the ditch line where topsoil salvage did not occur and subsoil compaction is severe. Do not use a subsoiler plow on native grasslands. [Section 13.0 Construction Clean-up and Reclamation]</p> <p>42. Where yellow-bellied marmot burrows/colonies were identified prior to construction and materials are available, place rock piles on the edge of the Project Footprint to enhance habitat for this prey species. On privately owned lands, this measure will be implemented where landowner agreements allow.</p> <p>43. Use seeding and planting of rooted plant materials as specified in the Reclamation Management Plan (Section 9.0 of Volume 6 of the Environmental Plans) and Grasslands Survey and Mitigation Plan (Section 5.0 of Volume 6 of the Environmental Plans). Seed mixes, species lists, and seeding/planting prescriptions are provided in these plans. The reclamation strategy will be compatible with the existing land use and the construction Line List.</p> <p>44. Revegetate as soon as ground and weather conditions permit to reduce or avoid soil erosion, and establish long-term cover. [Section 13.0 Construction Clean-up and Reclamation]</p>

TABLE 2 Cont'd

Activity/Concern	Mitigation Measures [EPP Reference]
<i>Habitat Restoration (cont'd)</i>	45. Remove and reclaim new temporary access roads developed for the Project upon completion of construction as outlined in the Access Management Plan and Reclamation Management Plan (Sections 2.1 and 9.1 of Volume 6 of the Environmental Plans), unless otherwise approved. Timing of removal and reclamation will vary depending on the season of construction. [Section 9.0 Access Roads for Pipelines]
<i>Documentation</i>	<p>46. An Environmental Inspector will review, collect, organize and disseminate all environmentally-related information and documentation that arises during construction, and will be responsible for the preparation of daily Environmental Inspection reports (see the Compliance Management Plan in Volume 10 of the Environmental Plans).</p> <p>47. Environmental information (e.g., erosion concerns or natural drainage patterns) will be collected throughout construction for documentation and the assessment of effectiveness of procedures/measures used to aid or inform the decision-making process during post-construction (see the Compliance Management Plan in Volume 10 of the Environmental Plans).</p> <p>48. The Environmental Inspector will document construction methods, decisions related to implementation and location of mitigation measures and final reclamation measures and issues encountered, as well as communication records for discussions with BC MFLNRO or other regulatory agencies.</p> <p>49. Ensure sighting records for American badger are provided to the Environmental Inspector. Records will be maintained and made available for reporting to applicable regulatory agencies (e.g., BC CDC).</p>
<i>Operations</i>	<p>50. Implement the appropriate vegetation management measures in consideration of species at risk and their habitat (e.g., restrict vegetation management to the minimum width required for the safe operation and inspection of the pipeline, and allow vegetation outside of this area to regenerate).</p> <p>51. Minimize the use of herbicides, where badger burrows have been observed. Consider non-chemical options as the primary method to manage non-woody problem vegetation (e.g., mowing or hand pulling). When non-chemical vegetation management options are not practical (e.g., invasive plant removal) utilize spot treatment applications of herbicides as necessary.</p>
<i>PCEM</i>	52. Monitor and implement remedial measures, if warranted, to ensure restoration is adequate. Mitigation measures implemented will be monitored for effectiveness as discussed in Section 6.0 and Section 7.0 below.

Figure 1 Retention and Replacement of Biophysical Features/Attributes of Critical Habitat for American Badger^{1,2}



1. Guidance provided to inform field-level decisions on the application of mitigation measures to preserve biophysical features/attributes of American Badger critical habitat. Note, measures in the Pipeline EPP (Volume 2 of the Environmental Plans), the Reclamation Management Plan (Section 9.1 of Volume 6 of the Environmental Plans) and Grasslands Survey and Mitigation Plan (Section 5.4 of Volume 6 of the Environmental Plans) are applicable whether the route is in or out of critical habitat.
2. Early draft critical habitat has been identified for American badger. The stages of critical habitat are: final (federal Recovery Strategy is final), proposed (federal Recovery Strategy has been reviewed and next step is to be posted on the Species at Risk Public Registry for a 60-day consultation); candidate (federal Recovery Strategy has completed internal federal review), and early draft (federal Recovery Strategy has not completed internal federal review).
3. Measures are taken from Table 2 of this Plan and are not a comprehensive list of mitigation measures for American badger. The steps and measures presented above are specific to the biophysical features/attributes of American Badger critical habitat. Performance indicators and measureable targets have been identified for American badger and further detail is provided in Section 6, Table 3 of this Plan.

6.0 MEASURING MITIGATION AND RESTORATION SUCCESS

Mitigation measures will be monitored to evaluate effectiveness. Monitoring will measure performance indicators to determine if the targets outlined in Table 3 are met, and therefore residual effects have been mitigated or reduced such that the survival or recovery of the local population is not adversely affected by the Project. The targets act as triggers for implementation of corrective measures if the mitigation measures are found to be underperforming. The performance indicators and targets presented in Table 3 may be adjusted based on further review of information (e.g., aerial patrols/field data) and consultation with the Appropriate Government Authorities, including receipt of new information (updated critical habitat mapping). Additional baseline data will be collected prior to Project activity to further inform the implementation of mitigation measures and the monitoring approach.

TABLE 3

PERFORMANCE INDICATORS AND MEASURABLE TARGETS FOR AMERICAN BADGER

Goal	Performance Indicator	Measurable Target
1. Maintain soil characteristics that allow for digging, where present prior to construction.	<ul style="list-style-type: none"> Soil compaction 	<ul style="list-style-type: none"> Soil compaction measures are consistent with adjacent undisturbed conditions (i.e., target < 20% increase in compaction level on the Project Footprint).¹
2. Restore disturbed vegetation to open habitats consistent with surrounding land use and vegetation communities.	<ul style="list-style-type: none"> Vegetation community composition and cover measured by layer: <ul style="list-style-type: none"> vegetation species list % cover native species % cover seeded non-native species (agronomic) % cover, density and distribution invasive non-native (weed) species % cover leaf litter % cover bare ground % cover rock Grassland status as an indicator of grassland function 	<ul style="list-style-type: none"> For areas within the Ponderosa Pine (PP), Bunchgrass (BG) and Interior Douglas-fir (IDF) very hot dry biogeoclimatic (sub)zones, minimum 50% cover of regenerating native vegetation (natural regeneration, seeded or planted) and minimum 20% cover bare soil, with seeded non-native (agronomic) vegetation, litter, rock and cryptogamic crust (where naturally occurring) making up the remaining percent cover. For areas that overlap native grasslands, refer to the Grasslands Survey and Mitigation Plan for additional targets (Section 5.4 of Volume 6 of the Environmental Plans).^{2,3} For areas within the IDF moist warm biogeoclimatic subzone, minimum 75% cover of regenerating native (natural regeneration, seeded or planted) and seeded non-native (agronomic) vegetation and litter (< 25% bare ground).² No new introduced invasive species/noxious weeds; extent of weeds is maintained or reduced from pre-construction conditions.
3. Avoid mortality of badger during construction and operations.	<ul style="list-style-type: none"> Incidents involving badger mortality or injury Environmental and Compliance Education Program Compliance tracking and documentation 	<ul style="list-style-type: none"> No incidents causing badger mortality or injury reported during construction. 100% of personnel working on-site in areas with potential to encounter wildlife species at risk receive environmental and compliance education that includes a species at risk component, prior to working on-site. 100% compliance with reporting and documentation protocols, environmental issues tracking and reporting.

- Notes:**
- 1 A 20% range of deviation was used to define what is considered "similar" to pre-construction conditions. This target was selected to be achievable while reflecting the variability inherent in natural systems and margins of error expected in their quantification.
 - 2 Target selected based on professional experience of Trans Mountain's reclamation and vegetation experts supported by baseline information collected for the Project and other Projects in similar regions. Differing minimum per cent cover targets selected across the Project are to account for differences in climate and soil conditions (i.e., average temperature, precipitation, soil moisture and soil nutrients) characteristic of different biogeoclimatic zones along the Project.
 - 3 Native grasslands as identified in the Grasslands Survey and Mitigation Plan (Section 5.4 of Volume 6 of the Environmental Plans) overlap early draft critical habitat American badger in several locations between KP 822.0 and KP 857.7. Refer to Table 3-2 in the Grasslands Survey and Mitigation Plan for more detailed (Section 5.4 of Volume 6 of the Environmental Plans).

7.0 MONITORING

Trans Mountain will monitor the effectiveness of the measures implemented in critical habitat for American badger to determine if the goals of this Plan have been met, and to identify the need for corrective measures. Ground-based field work and review of compliance tracking, as well as tracking any potential outstanding or new environmental issues will be used to monitor the effectiveness of the mitigation.

7.1 Monitoring Timeframe

Monitoring will occur during the construction period and in the first, third and fifth growing seasons following the completion of final clean-up. Trans Mountain will complete a final evaluation of the effectiveness of mitigation upon completion of the five-year PCEM period and will determine if targets have been met and whether additional monitoring may be warranted. For example, if corrective measures are needed at site-specific locations, additional monitoring will be completed following their implementation until targets are met.

7.2 Monitoring Strategy

The intent of monitoring is to measure performance indicators to determine the effectiveness of mitigation, and inform the need for corrective measures. The measurable targets listed in Table 3 (Section 6.0) act as triggers for implementation of corrective measures if the mitigation measures are found to be underperforming. Table 4 summarizes the monitoring strategy that will be applied for each goal of the Plan. Additional explanation is provided in the following subsections.

TABLE 4
MONITORING STRATEGY

Goal	Monitoring Strategy
1. Maintain soil characteristics that allow for digging, where present prior to construction.	<ul style="list-style-type: none">• Soil compaction tester (penetrometer)
2. Restore disturbed vegetation to open habitats consistent with surrounding land use and vegetation communities.	<ul style="list-style-type: none">• Vegetation sampling• Meandering transect (weed patch location, species, density and distribution)
3. Avoid mortality of badger during construction and operations.	<ul style="list-style-type: none">• Compliance tracking and reporting• Environmental issues tracking and reporting

7.2.1 Habitat Restoration Monitoring

Restoration of soil and vegetation characteristics of critical habitat and maintaining habitat capability will be achieved by restoring surface contours, avoiding soil compaction, and regenerating native vegetation. Restoration of natural vegetation communities will be monitored using a vegetation sampling protocol consistent with the PCEM program for the Project (refer to the Reclamation Management Plan [Section 9.0 of Volume 6 of the Environmental Plans]). In addition, early draft critical habitat that overlaps native grasslands will be monitored in accordance with the Grasslands Survey and Mitigation Plan (Section 5.4 of Volume 6 of the Environmental Plans) and measurable targets identified in that plan will apply. Vegetation sample site locations will be stratified by habitat type and reclamation strategy (e.g., seed mix, planting), where there is variation in these factors and will also be contingent on landowner agreements on private lands. The vegetation cover targets for the Project were selected to account for differences in climate and soil conditions (i.e., average temperature, precipitation, soil moisture and soil nutrients) characteristic of different biogeoclimatic zones along the Project. A minimum per cent cover target of 85% is used for typically moist regions/habitat types (i.e., moist forests in Coastal Western Hemlock zone). A 50% cover target is used for arid regions/habitat types (i.e., Ponderosa Pine, Bunchgrass and Interior Douglas-fir [IDF] very hot dry zones in BC interior), and 75% cover target is used for moderate climatic regions (i.e., Sub-Boreal Spruce, Interior Cedar-Hemlock, Montane Spruce, Engelmann Spruce-Subalpine fir, and IDF dry cool and moist warm zones and subzones). Non-native agronomic species are included in the target to account for the presence of short-lived cover crop species that may be seeded following construction in areas where soil erosion and weed establishment are

identified as issues. The cover crop is designed to be short-lived (*i.e.*, < 3 years) and cover crop species are expected to be present at the beginning of the PCEM period, but should be absent by year three, by which time native species will have re-established.

Each vegetation sample will be comprised of a permanent 50 m transect perpendicular to the pipeline construction footprint. Along each 50 m transect, vegetation will be monitored by sampling four 1 m² plots. Three sample plots will be evenly spaced within the pipeline construction footprint (minimum 5 m apart) and the fourth will be outside of the Project Footprint within the adjacent undisturbed habitat. Each 1 m² plot centre will be marked with a pin-marker and a GPS location recorded to relocate the plot at the same location in subsequent monitoring years.

Habitat restoration monitoring will be completed by qualified professionals. The performance indicators for restoration of disturbed vegetation (Table 3) will be measured in each vegetation sample plot (*e.g.*, vegetation cover, species and weeds). Weeds will also be noted within the Project Footprint near each monitoring location using a method consistent with the BC Invasive Alien Plant Program standards (BC MFLNRO 2016) to allow detection of weed infestations or spread.

During construction, soil compaction will be measured prior to topsoil replacement in selected locations and compared to adjacent undisturbed habitat to ensure excessive subsoil compaction does not occur. During the first year of monitoring, soil compaction will be measured within vegetation sample plots, using a soil compaction tester (penetrometer), to confirm that the measurable target is met. Subsequent monitoring of soil compaction will not be completed in monitoring years three and five if targets are met.

7.2.2 Mortality Monitoring

The final goal of the Plan to avoid Project-caused mortality of American badger will be achieved by avoiding disturbance to active badger dens. Mitigation success for mortality avoidance will be monitored by tracking and reviewing compliance with environmental and compliance education, documentation of pre-construction den search results, and tracking and reporting environmental issues documented during the construction phase of the Project. Personnel who have not received environmental and compliance education will not be allowed to, or will cease to, work within areas with potential to encounter American badger burrows until they receive the training.

7.3 Corrective Measures

The results of monitoring will inform the need for corrective measures. Depending on the performance indicator, evaluation against the measurable target may be conducted during construction, or at each monitoring year (*i.e.*, years one, three and five). If, at any point during the five-year monitoring program, performance indicators are found to be underperforming and are unlikely to meet the measurable targets within the five-year timeframe, the corrective measures will be implemented as soon as feasible. The need for and type of corrective measures will be determined using the following systematic approach in Figure 2, which will be applied to each monitoring year during the monitoring program. Corrective measures will be implemented in a timely manner. Where corrective measures may be implemented to achieve the targets and goals of the Plan, additional monitoring will be completed following their implementation until monitoring results indicate the target has been met. The adaptive approach to monitoring and implementing corrective measures will improve understanding of the optimal measures and conditions for mitigation implementation that are most effective.

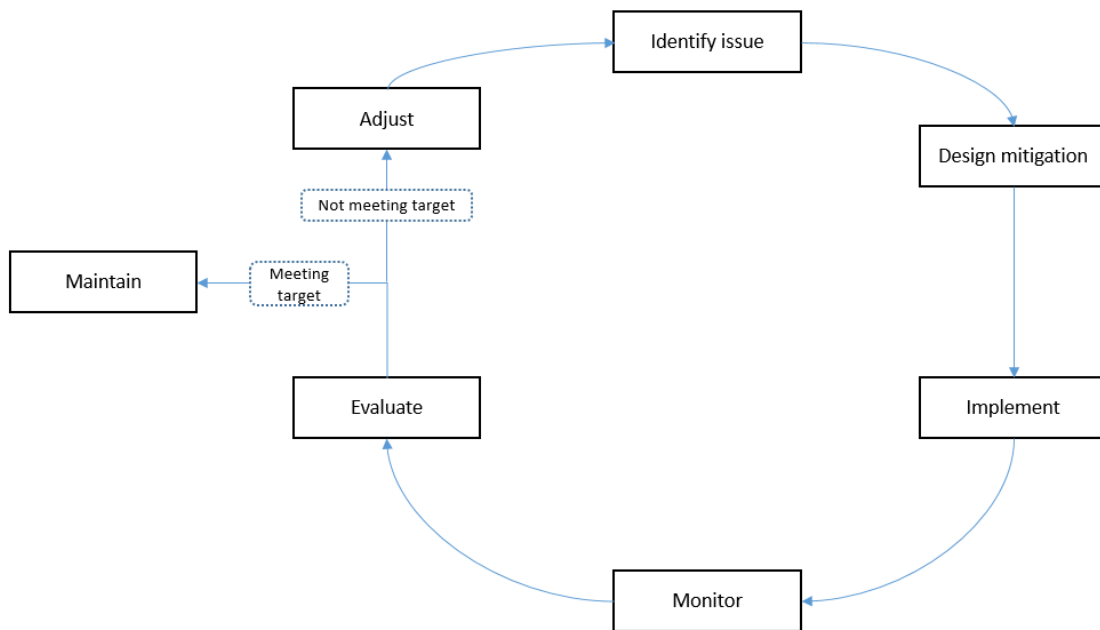


Figure 2 Adaptive Approach to the Application of Corrective Measures

Examples of corrective actions that may be applied in the event that the performance indicators are found to be underperforming and unlikely to meet the measurable targets within the five-year timeframe are presented in Table 5.

TABLE 5
CORRECTIVE ACTIONS

Goal	Measurable Target	Example of Underperforming Target	Example of Corrective Action for Underperforming Target
1. Maintain soil characteristics that allow for digging, where present prior to construction.	<ul style="list-style-type: none"> Soil compaction measures are consistent with adjacent undisturbed conditions (<i>i.e.</i>, target <20% increase in compaction level on the Project Footprint). 	<ul style="list-style-type: none"> Increase in measured compaction levels are >20% of levels measured on adjacent undisturbed areas. 	<ul style="list-style-type: none"> Prior to topsoil replacement, rip compacted subsoils, where compaction is an issue on the pipeline construction footprint.
2. Restore vegetation to open habitats consistent with surrounding land use and vegetation communities.	<ul style="list-style-type: none"> Minimum 50% cover of regenerating native vegetation (natural regeneration, seeded or planted) and maximum 20% cover bare soil, with seeded non-native (agronomic) vegetation, litter, rock and crytogamic crust (where naturally occurring) making up the remaining percent cover. 	<ul style="list-style-type: none"> Less than 50% cover of revegetating native (natural regeneration, seeded or planted) and >20% cover of bare soil. 	<ul style="list-style-type: none"> Supplement existing reclamation prescription with additional seeding and/or planting. Review characteristics of site, and reclamation prescription, and modify as necessary.
	<ul style="list-style-type: none"> No new introduced invasive species/noxious weeds; extent of weeds is maintained or reduced from pre-construction conditions. 	<ul style="list-style-type: none"> New introduced invasive species/noxious weeds observed; weed extent is increased compared to pre-construction conditions. 	<ul style="list-style-type: none"> Implement mowing or hand pulling to manage spread of weeds, or spot treatment applications of herbicides as necessary.

TABLE 5 Cont'd

Goal	Measurable Target	Example of Underperforming Target	Example of Corrective Action for Underperforming Target
3. Avoid mortality of badger during construction and operations.	<ul style="list-style-type: none"> No incidents causing badger mortality or injury reported during construction. 	<ul style="list-style-type: none"> Initiation of clearing or construction is scheduled during sensitive periods for badger. 	<ul style="list-style-type: none"> Conduct a pre-construction survey for active dens and implement protective buffer as necessary. Track and report results.
	<ul style="list-style-type: none"> 100% of personnel working on-site in areas with potential to encounter wildlife species at risk receive environmental and compliance education that includes a species at risk component, prior to working on site. 	<ul style="list-style-type: none"> Personnel on-site have not received environmental and compliance education. 	<ul style="list-style-type: none"> Workers will cease work within critical habitat. Enroll worker(s) in next available environmental and compliance training session.
	<ul style="list-style-type: none"> 100% compliance with reporting and documentation protocols, environmental issues tracking and reporting. 	<ul style="list-style-type: none"> Protocols for environmental issues tracking and reporting are not being followed. 	<ul style="list-style-type: none"> Review tracking and reporting protocol to identify insufficiencies. Implement additional training for responsible personnel.

7.4 Reporting

Results of PCEM for American badger will be submitted to the NEB on or before January 31 following the first, third and fifth complete growing seasons after completing final clean-up as per NEB Condition 151. The PCEM report will provide the results of any additional field work conducted (*i.e.*, locations surveyed and burrows identified), detail on the implementation of site-specific mitigation and habitat restoration measures, information on the indicators measured and their performance in reaching the measurable target, the monitoring methods used, and details of corrective actions taken (if any), as well as an updated consultation record. The environmental monitoring report filed after the fifth full growing season after completing clean-up, will include information on the effectiveness of mitigation and corrective actions and how learnings are applied by Trans Mountain. The report will also include information on those goals that have not been achieved during the duration of the PCEM program and the need for any further corrective actions and monitoring.

8.0 CONCLUSION

Trans Mountain has used available information to identify areas with potential for burrowing mammal activity, specifically American badger, yellow-bellied marmots and Columbian ground squirrels within the broad area of early draft critical habitat provided by ECCC. This included a detailed review of aerial imagery, field work results (2013, 2014 and 2015), BC CDC data, TEM and consultation. Trans Mountain will continue to refine these areas (e.g., consultation, aerial patrols). Pre-construction surveys will be conducted in the areas identified.

The focus of the Plan is to avoid, minimize and restore habitat on-site as per the mitigation hierarchy. The goals and mitigation measures are designed to effectively alleviate or minimize residual Project effects on American badger. Performance indicators and measurable targets have been developed and shared with Appropriate Government Authorities for their feedback. The performance indicators are intended to measure and monitor the success of the mitigation and habitat restoration measures to demonstrate that measurable targets have been met and therefore residual effects have been mitigated or reduced such that the survival or recovery of the local population is not adversely affected by the Project.

Measures to reduce the residual effect of the Project on American badger and their habitat have been implemented during Project planning and will continue through the remaining phases of the Project with guidance from relevant government policies and management objectives, consultation and incorporation of applicable TEK and TLU studies.

The PCEM program will report the progress of the performance indicators and measurable targets in the first, third and fifth growing seasons following the completion of final clean-up. After the fifth growing season, a qualitative and quantitative evaluation of the targets after implementation of mitigation and any corrective actions will be provided. This will detail what residual effects remain (if any) and assist Appropriate Government Authorities in determining whether an acceptable level of impact for which no additional mitigation would be needed has been achieved. BC EAO Condition 16 requires a Wildlife Species at Risk Mitigation and Preliminary Offset Plan that also requires this information in order to determine the need for offsets. BC EAO Condition 16 is due at least six months before the commencement of operations. A final offset plan is required if monitoring of habitats indicates that impacts remain after five years following the commencement of operations. Trans Mountain will provide the NEB with a copy of the Final Offset Plan, as well as a summary of comments received from Appropriate Government Authorities on any draft offset plans submitted for their feedback.

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APPENDIX A

CONSULTATION AND ENGAGEMENT

Consultation and engagement activities related to the Plan were completed with Appropriate Government Authorities, potentially affected Aboriginal groups, affected landowners/tenants and species experts. Opportunities to discuss American badger and identify issues or concerns were also provided to public stakeholders during meetings, workshops and ongoing engagement activities.

Consultation and engagement opportunities began in May 2012 with the Project announcement and are ongoing.

1.0 CONSULTATION AND ENGAGEMENT OVERVIEW: DRAFT PLAN DEVELOPMENT

Reports on public consultation activities completed between May 2012 and June 30, 2015 were filed with the NEB and are available in the Application (Volume 3A: Stakeholder and Volume 3B: Aboriginal; Filing ID [A55987](#)) as well as in Consultation Update No. 1 and Errata, Technical Update No. 1 (Filing ID [A59343](#)) / Consultation Update 2 (Filing IDs [A62087](#) and [A62088](#)), Consultation Update 3 (Filing IDs [A4H1W2](#) through [A4H1W8](#)) and Consultation Update 4 (Filing ID [A72224](#)). These reports include results of consultation conducted to June 30, 2015, identification of issues and concerns as well as Trans Mountain's response and are included in Table A-1. Where appropriate, Trans Mountain's response has been updated to reflect information developed since the original response was provided during the NEB proceeding for the Project.

Consultation and engagement activities completed between July 1, 2015 and July 2017 have not been filed on the public record with the NEB. Any new issues and concerns regarding American badger identified during this period, as well as Trans Mountain's response, are described below.

2.0 CONSULTATION AND ENGAGEMENT OVERVIEW: DRAFT PLAN

The draft Plan was posted on www.transmountain.com/environmental-plans on September 16, 2016. The comment period closed on January 13, 2017, however, feedback received as recently as July 2017 has been considered. Subsequently, two additional potentially affected Aboriginal groups were identified by the Board, and Trans Mountain and provided a copy of the Plan on July 6, 2017 for feedback. Email or mail notification regarding the Plan was sent to 141 public stakeholders, 17 regulatory authorities, 23 Aboriginal groups and all affected landowners. The notification included a summary description of the Plan, a request for review, the timing of the comment period and contact information. Aboriginal groups were offered the opportunity for an in-person meeting to review the Plan. See Appendix C for a complete list of notified stakeholders.

In addition to direct notification, the online posting of each Plan was promoted through Trans Mountain's weekly e-newsletter, Trans Mountain Today, which provides Project updates, regulatory information, stories and interviews to more than 6,000 subscribers. Each week Trans Mountain Today included a focus on a specific plan, or group of plans, as well as a reminder of all plans available for review.

2016:

- September 22 - Wildlife Mitigation and Habitat Restoration Plans;
- September 29 - Pipeline EPPs;
- October 6 - Air Quality Management Plans;
- October 13 - Watercourse and Water Ecosystems Plans;
- October 20 - Vegetation Management Plans;
- October 27 - Air Quality Plans;
- November 3 - Socio-Economic Effects Monitoring Plan;

- November 10 - Access Management Plan;
- December 22 - General promotion all plans; and
- December 29 - General promotion all plans.

2017:

- January 5 - General promotion all plans; and
- January 12 - General promotion all plans.

Trans Mountain is committed to ongoing engagement throughout the life of the Project. The start and end date for the review and comment period for each environmental management plan is defined. These timelines are required to allow time for preparation of the final Plan in order to meet regulatory requirements and NEB submission dates.

3.0 CONSULTATION AND ENGAGEMENT: ACTIVITIES AND FEEDBACK

Consultation and engagement activities completed with identified stakeholder groups are described below, including: public stakeholders (Section 3.1); regulatory authorities (Section 3.2); Aboriginal groups (Section 3.3); and landowner/tenants (Section 3.4).

Feedback on the draft Plan, Trans Mountain's response, and where each issue or concern is addressed in the Plan has been outlined in each section according to stakeholder group.

3.1 Public Consultation

3.1.1 Public Consultation Summary – May 2012 to June 2015

No specific feedback regarding American badger was received during public consultation and engagement activities between May 2012 and June 30, 2015.

General issues and concerns regarding wildlife and wildlife habitat received during this period were submitted to the NEB in the Application or in subsequent filings (Project proceedings). Table A-1 provides a summary of the key themes with relevance to American badger.

TABLE A-1
SUMMARY OF PUBLIC CONSULTATION - MAY 2012 TO JUNE 2015¹

Issue or Concern	Summary Trans Mountain Response	Where Addressed
Potential Project effects to species at risk	Potential Project effects, as well as mitigation to reduce residual Project effects to American badger have been considered in the development of this Plan.	Sections 3.1, 3.2 and 5.0 of this Plan
Protection of wildlife habitat and species at risk	Project planning and implementation includes measures to avoid or reduce Project effects to wildlife and wildlife habitat, particularly for species at risk. The Application presented detailed mitigation measures specific to wildlife and wildlife habitat, as well as Project EPPs that detail environmental procedures and mitigation measures to be implemented during construction of the various components of the Project. The measures serve to avoid, reduce or mitigate potential adverse environmental effects. Measures to avoid, minimize and mitigate Project effects to American badger have been considered and developed as part of this Plan.	Sections 7.2.10 and 7.2.11 of Volume 5A of the ESA Pipeline EPP (see Volume 2 of the Environmental Plans) NEB Condition 44: Wildlife Species at Risk Mitigation and Habitat Restoration Plans (i.e., American Badger Mitigation and Habitat Restoration Plan)
Potential for habitat fragmentation	The primary objective of the route selection process was to locate the pipeline contiguous to the existing TMPL right-of-way where possible. This reduces fragmentation and clearing requirements.	Section 5.1.1 of this Plan Section 2.8 of Volume 4A of the ESA
Protection of parks and ecologically sensitive areas	Several adjustments to the pipeline route have been made within the pipeline corridor since the Application was filed in December 2013, including adjustments within the corridor, minimizing of the workspace and avoiding some parks, where feasible. Trans Mountain has relocated and reconfigured the pipeline alignment and design to improve constructability, avoid congestion in urban areas and reduce the length Parks and ecologically sensitive areas, while also attempting to parallel existing linear corridors and/or locate the pipeline route in already established transportation/utility corridors.	Section 5.1.1 of this Plan

Note: 1 Included in NEB Project proceedings.

3.1.2 New Interests, Issues, Concerns and Response – July 2015 to February 2017

No new issues or concerns specific to this Plan were identified through public consultation and engagement activities between July 2015 and February 2017.

3.2 Regulatory Consultation

Trans Mountain has initiated consultation and will continue to work with Appropriate Government Authorities to ensure that the measures implemented to avoid, minimize and mitigate Project effects on American badger and their habitat align with relevant government policy. A summary of consultation related to wildlife and wildlife habitat is provided in Table 2.2.1 of the Wildlife Technical Report (Filing ID A3S2Q3) (Trans Mountain 2013) and Table 2.2.1 of the Supplemental Wildlife Technical Report (Filing ID A4H6D2) (Trans Mountain 2014).

3.2.1 Regulatory Consultation Summary – May 2012 to June 2015

Consultation applicable to American badger received during regulatory engagement activities between May 2012 and June 30, 2015 is summarized in Table A-2.

TABLE A-2
SUMMARY OF REGULATORY CONSULTATION
ACTIVITIES RELATED TO AMERICAN BADGER (MAY 2012 TO JUNE 2015)

Name and Title	Method of Contact	Date	Comments	Where Incorporated in Plan
ECCC				
Jennifer Wilson Environment Assessment Officer	Email	September 9, 2013	ECCC provided hard-copy maps showing species with critical habitat (proposed, candidate, early draft) including American badger.	N/A (superseded by new information)
Agathe LeBeau Environmental Assessment Program Analyst	Email	December 23, 2013	ECCC provided a Summary of Draft Critical Habitat Information for TMEP - December 2013, which included draft biophysical attribute descriptions for American badger early draft critical habitat (among other species), and activities likely to result in the destruction of critical habitat.	N/A (superseded by new information)
Jennifer Wilson Environment Assessment Officer	Email	April 3, 2014	ECCC provided updated hard-copy maps for critical habitat (including for American badger), as well as an updated version of Summary of Draft Critical Habitat Information for TMEP - March 2014.	N/A (superseded by new information)
Ian Parnell Acting Head of Species at Risk Recovery Unit	Email	November 13, 2014	ECCC provided shapefiles for critical habitat intersecting with the proposed pipeline corridor and within a 1 km buffer. This included information for American badger (<i>Jeffersonii</i> ssp.) (10 km UTM grid of general location of early draft critical habitat).	Section 3.2
BC MOE: Victoria				
Richard Weir, Carnivore Conservation Specialist	Email	March 11, 2013	Requested information on American badger including habitat model. March 21, 2013: R. Weir responded that there are no new badger initiatives, although ECCC was in the process of defining critical habitat for badgers. Noted that there is a predictive model for badgers in this report: Conservation Strategies for North American Badgers in the Thompson and Okanagan Regions. Final Report for the Thompson-Okanagan Badger Project (Weir <i>et al.</i> 2003). This model will be difficult to reconstruct and apply easily. A revision is being prepared for application across the Thompson Region and is not available at this time.	Section 3.1
BC MFLNRO: Thompson/Okanagan Region, Kamloops				
Robin Reudink, Ecosystems Biologist	Email	February 18, 2013	Requested information on available wildlife capability-suitability products for American badger (among other species).	Section 3.1
John Surgenor, Wildlife Biologist	Telephone	April 14, 2014	Discussed the early draft critical habitat for American badger identified by ECCC, specifically how the mapped area provided corresponds to BC CDC Records.	Section 3.2

3.2.2 *Feedback Regarding the Draft Plan*

A summary of consultation applicable to American badger received during regulatory engagement activities between July 2015 and February 2017 as well as feedback received during the September 16, 2016 to February 2017 review and feedback period related to the draft Plan is described in Table A-3. ECCC provided feedback on the Plan on May 12, 2017 after the Plan was submitted to the NEB. A summary of feedback from ECCC is provided in Section 3.2.3 and Table A-4.

TABLE A-3

SUMMARY OF REGULATORY CONSULTATION ACTIVITIES RELATED TO AMERICAN BADGER (JULY 2015 TO FEBRUARY 2017)

Invited Stakeholder Group/Agency Name	Method of Contact	Date of Consultation Activity	Feedback/Stakeholder Response	Trans Mountain Response	Where Addressed in the Plan
ECCC Randal Lake Unit Head, Species at Risk Recovery	Email	August 25, 2015	ECCC provided updated shapefiles for critical habitat intersecting with the proposed pipeline corridor and within a 1 km buffer. Note, the information provided for American badger did not change from the information previously provided on November 13, 2014.	N/A (no new information for American badger)	N/A (no new information for American badger)
BC MOE Victoria Richard Weir, Carnivore Conservation Specialist	Telephone	September 2, 2016	A conference call was held on September 2, 2016 to discuss an Investigative Use Permit for the Project. Discussed timing windows and setback distances specific to American badger. Provincial agencies will review internally and provide guidance for specific application to the pipeline project. A 500 m buffer for an active American badger maternal den was identified by government regulators during this call, although the citation for this buffer was not provided (<i>i.e.</i> , it is not listed in the BC Oil and Gas Commission (BC OGC) Environmental Protection and Management Guideline, or any other provincial guideline). Other participants in this call included S. Fitton and R. Reudink (BC MFLNRO), B. Murphy, A. Istead and A. MacKay (BC OGC) (see below).	The information has been incorporated into the Plan.	Section 5.0
BC MFLNRO: Thompson/Okanagan Region, Kamloops John Surgenor, Wildlife Biologist Robyn Reudink, Ecosystems Biologist	Meeting in Kamloops	September 17, 2015	BC MFLNRO provided early comments on mitigation and the importance of a Wildlife Species of Concern Discovery Contingency Plan.	This was an overview meeting that provided Trans Mountain with an opportunity to review the approach, relevant mitigation, new information, and schedule of reporting for NEB Condition 44 Plans.	All
BC MFLNRO: Thompson/Okanagan Region, Kamloops Robyn Reudink, Ecosystems Biologist	Meeting in Kamloops	March 22, 2016	<p>BC MFLNRO commented that for American badger there was a lack of emphasis on the biophysical attribute of small mammal prey. In response, it was noted that the retention of small mammal prey populations had been considered, however, previous field work did not identify any concentrated ground squirrel colonies; attributing a decline in density to Project activity would be challenging; and research suggests that small mammals have been shown to recolonize recently disturbed areas following pipeline construction. Since there is a low probability that this biophysical attribute of critical habitat for American badger (prey) would be affected by the Project, it was not included. BC MFLNRO commented that presenting a strong rationale for excluding small mammal prey could be adequate provided that the literature clearly supports the rationale. It was noted that there may be variability between monitoring sites. For example, baseline conditions may indicate the extent of bare ground varies between grassland ecosystems (some grasslands naturally have barer ground than others), therefore the target for % cover should reflect and will vary depending on baseline conditions (<i>i.e.</i>, different values for different ecosystems in the grasslands). BC MFLNRO will be provided the opportunity to review draft targets for vegetation restoration and provide feedback. As noted in this Plan, a minimum 50% cover target is used for arid regions/habitat types.</p> <p>Pre-construction surveys for badger dens, protective buffers and timing windows were discussed. BC MFLNRO noted that the least risk window for construction to reduce mortality risk to badger would be mid-summer to early winter (July 15 to October 15) since this is a period when badgers are active. Although maternal dens are particularly important, other dens should not be overlooked. Pre-construction sweeps would be influenced by the season of clearing and construction. For example, Project clearing in spring/summer in areas of critical habitat (that is, presence of all biophysical attributes; high suitability to support badgers; previous records of badger burrows) would require a pre-construction sweep to identify any active maternal badger dens. During winter, badgers will have more than one winter burrow and will move from one to another, but will use fewer burrows and move shorter distances in winter. To avoid impacts to badger burrows in the winter, it was suggested that areas with known potential to support badgers could be searched in the late-fall prior to snowfall to identify and record any burrows that have evidence of recent use. Note, BC MFLNRO received input from R. Weir (BC MOE) on this guidance. It was also discussed how far in advance pre-construction sweeps should be completed, and this is dependent on the scheduling of Project activity, and MFLNRO noted a few weeks prior to activity is adequate.</p> <p>BC MFLNRO also suggested that perhaps the aerial patrols (conducted for the existing TMPL right-of-way) may be an efficient and cost-effective method to identify badger dens. The use of aerial overflights was being used by a First Nation group to identify badger dens. In reference to a setback buffer, current provincial guidelines do not specify a buffer for a maternal den. At this time, a 200 m buffer will be used as the setback from any identified active maternal badger dens. It was noted that there is a Wildlife Species of Concern Discovery Contingency Plan that provides protection measures in the event an active badger burrow is discovered during clearing/construction (regardless of season).</p>	Discussed NEB Draft Condition 44 in detail, specifically the components of this Condition related to measurable goals for evaluating mitigation success and the PCEM program. TMEP presented and sought input on proposed measurable goals, performance indicators, measurable targets and monitoring strategy for American badger. BC MFLNRO were reminded that ECCC provided early draft critical habitat as a 10 km grid that overlapped with approximately 119 km of the TMEP route. Approaches to narrowing this length were discussed. Information from this meeting has been incorporated into this Plan. Note, Trans Mountain is investigating whether their aerial patrol videos (for the existing TMPL right-of-way) are useful for burrow identification.	Sections 5.0, 6.0 and 7.0
BC MFLNRO: Thompson/Okanagan Region, Kamloops Susan Fitton, Senior Project Manager Robyn Reudink, Ecosystems Biologist	Telephone	September 2, 2016	Participant in provincial agency discussion to discuss an Investigative Use Permit for the Project. See comment above for R. Weir (BC MOE).	The information has been incorporated into the Plan.	Section 5.0
BC OGC Brian Murphy, Executive Director – Major Projects Ashley Istead, Natural Resource Officer – Major Projects Allison MacKay, Environmental Specialist – Stewardship	Telephone	September 2, 2016	Participant in provincial agency discussion to discuss an Investigative Use Permit for the Project. See comment above for R. Weir (BC MOE).	The information has been incorporated into the Plan.	Section 5.0
BC MFLNRO, BC OGC	Meeting	October 7, 2016	How have provincial wildlife habitat boundaries been taken into account? The plan appears to use federal boundaries only. There are no "Wildlife find" contingency plans. How has BC's list of "Important Species" been identified?	The NEB Condition is specific to early draft, candidate, proposed and final critical habitat which ECCC shared with Trans Mountain. A Wildlife Species of Concern Encounter and Discovery Contingency Plan is provided as Appendix B of the Pipeline EPP. American badger has identified early draft critical habitat, are listed by BC OGC listed as a "High Priority Wildlife Species" and is addressed by this Plan.	N/A - NEB Condition 44 is specific to species with early draft, candidate, proposed and final critical habitat

TABLE A-3 Cont'd

Invited Stakeholder Group/Agency Name	Method of Contact	Date of Consultation Activity	Feedback/Stakeholder Response	Trans Mountain Response	Where Addressed in the Plan
BC OGC	Meeting	October 7, 2016	How have BC OGC's Environmental Management and Protection Regulation "High Priority Species" been identified and incorporated into NEB's Condition Plans?	NEB Condition 44 is very specific to wildlife species with early draft, candidate, proposed and final critical habitat as per the federal recovery process. The NEB has not asked for specific mitigation and habitat restoration plans for each wildlife species listed as BC OGCs "High Priority Wildlife Species", with the exception of caribou, grizzly bear and spotted owl which are covered by other NEB Condition Plans.	N/A - NEB Condition 44 is specific to species with early draft, candidate, proposed and final critical habitat
BC OGC	Email	December 16, 2016	<u>Section 5.1.2 Project Scheduling</u> Natal denning period is from April 1st to August 15th and is a critical time for this species of concern. Planning clearing and construction from mid-summer to fall does not afford complete protection during the natal denning period. There is the potential for dens to be active all year round and as such a pre-site survey (regardless of work window) should be completed prior to construction. Since the natal denning period begins in April, it is recommended that pre-site surveys identifying natal dens be completed in April or later. Completing surveys earlier than this may cause dens being mislabeled as 'inactive' or not accounted for. This could lead to potential conflict or impact to badgers or their habitat if this misinformation is used to schedule subsequent clearing or construction works.	The information related to timing was based on consultation with BC MFLNRO and is explained in the Regulatory Consultation Table in Appendix B. Trans Mountain notes that the source of the timing window recommended by the BC OGC (April 1 to August 15) is not provided in the BC OGC Environmental Protection and Management Guideline (March 2016) and is instead referred to in BC's Southern Interior: Badger Wildlife Habitat Decision Aid (Weir and Almuedo 2010). Trans Mountain will adopt and use the approach recommended by BC MFLNRO to guide mitigation related to American badger.	Section 5.3 (Table 2)
BC OGC	Email	December 16, 2016	<u>Table 3 [now Table 2] Mitigation and Habitat Restoration Measures, Scheduling Activity Concern, Item 7</u> A 200 m setback from an active maternal den is not consistent with the Commission's expectations. As per the discussion in a meeting between TMEP, the BC OGC, and Richard Weir (Carnivore Conservation Specialist, BC MOE), it was the Commission's understanding that the appropriate setback to be applied to Badger natal dens was 500 m.	A conference call was held on September 2, 2016 to discuss an Investigative Use Permit for the Project. A 500 m buffer for an active American badger maternal den was identified by government regulators during this call, although the citation for this buffer was not provided (<i>i.e.</i> , it is not listed in the BC OGC Environmental Protection and Management Guideline, or any other provincial guideline). The Plan recommended a 200 m buffer in the absence of a referenced provincial guideline. A 200 m buffer was previously required by ECCC in BC (SARA-PYR-2012-0203), and by BC Hydro (AECOM 2011). In the event that an active maternal den is identified within the Project Footprint, Trans Mountain will apply a 500 m protective buffer, in consultation with BC MFLNRO, until the den is no longer active.	Section 5.3 (Table 2)
BC MFLNRO, Thompson Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 1.4 [now Section 1.3] Mitigation Hierarchy</u> Although residual impacts are mentioned in the plans, there is no assessment of residual impacts after measures to avoid, minimize/mitigate, and restore on site have been described. An understanding of residual impacts is crucial to our understanding of the impact of the project on these values. In some cases, it can be quantitative (<i>e.g.</i> , how much cottonwood nesting habitat for WSOW will be impacted), but a qualitative assessment may be necessary in some cases. There are instances where it seems uncertain how widely mitigation measures will be implemented and thus residual impacts may be calculated with more confidence after mitigation has been implemented. However, there should still be an initial quantitative or qualitative assessment of residual impacts with an associated level of certainty or confidence and these could be reported again in the post-construction monitoring. In addition, Section 1.4 (now Section 1.3) mentions that offsetting is only appropriate if residual impacts remain after measures have been taken; therefore, it is critical to identify these residual impacts (BC MOE 2014, Procedures for Mitigating Impacts on Environmental Values). In order to meet this recommendation Sections 4 and 5 need to be more specific in terms of how much critical habitat was surveyed or will be surveyed prior to construction, how much critical habitat is impacted (<i>e.g.</i> , nesting, roosting, foraging, etc.). In addition, a section analyzing residual impacts should be added. The Plans do not provide enough details to know what proportion of critical habitat was surveyed for biophysical attributes associated with nesting, foraging, or other categories of critical habitat. In addition to more information on existing surveyed areas, we recommend surveying the entire area of critical habitat impacted by the project. If some areas of foraging or other habitat cannot be surveyed, then the plan will have to assume that the biophysical attributes for one or more types of critical habitat are present.	Residual changes in habitat were assessed for a variety of wildlife species and species group indicators in the Application and related filings. Residual effects assessments used regulatory and ecological context, quantitative and qualitative measures, and an accepted method for characterizing residual effects. The NEB Condition 44 Plans do not repeat the entirety of the relevant species assessments; however, the locations on where this information can be found will be added. The focus of the NEB Condition 44 Plans is to avoid, minimize and restore habitat on-site as per the mitigation hierarchy. The goals and mitigation measures are designed to effectively alleviate or minimize residual Project effects. The performance indicators selected to measure and monitor the success of the mitigation and habitat restoration measures are intended to demonstrate that measurable targets have been met and therefore residual effects have been mitigated or reduced such that the survival or recovery of local populations are not adversely affected by the Project. Where field work has been completed to date, the NEB Condition 44 Plans provide the results of a review of the presence of biophysical attributes of critical habitat within the Project Footprint using the information provided by ECCC. Additional field work will be conducted prior to construction in areas that have not yet been reviewed to collect information on the presence of the biophysical attributes of critical habitat and assist in the determination of locations for site-specific mitigation implementation. For some species with extensive areas of critical habitat (<i>e.g.</i> , western screech-owl, American badger), a desktop review will be used to narrow the focus of field work to areas of particular importance (<i>e.g.</i> , nesting habitat) or high suitability. Mitigation will be implemented in areas where the biophysical attributes of critical habitat are present. Results of additional field work will be provided to Contractors in an internal deliverable. They will also be reported in the PCEM program reports in the first, third and fifth years following completion of reclamation activities. After the fifth growing season, a qualitative and quantitative evaluation of the measurable targets after implementation of mitigation and any corrective actions will be provided. This will determine what residual effects remain (if any) and assist Appropriate Regulatory Authorities in determining whether an acceptable level of Project impact for which no additional mitigation would be needed has been achieved.	Sections 3.0, 4.0, 6.0 and 8.0
BC MFLNRO, Thompson Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 6.0 Measuring Mitigation and Restoration Success</u> The measurable target for disturbed vegetation is to have a "Minimum 50% cover of regenerating native (natural regeneration, seeded or planted) and seeded non-native (agronomic) vegetation and litter (<50% bare ground)". There should be a reference to the number 50% and a rationale. There should be a reference relevant to each ecosystem type, for example, this 50% appears to cover lower, middle, and upper grasslands and 50% is also used for riparian ecosystems. You should consider whether a different target is needed for the different years post-construction monitoring is conducted (<i>e.g.</i> , target in year 1 vs year 5). In addition, 50% bare ground seems quite high even for grasslands and references for grassland communities indicate that most have bare ground of 10% or less (see Wikeem. 2005. Grassland Assessment Manual For BC by GCC; Steen. 2015. Churn Creek Protected Area Grassland Monitoring: Establishment of "GCC Method" Plots and Grassland Ecosystem Health Ratings in 2014; GCC. 2009. Grassland Monitoring Manual for BC: A Tool for Ranchers).	The references quoted for 10% or less cover of bare ground in grassland communities are specific to reference (<i>i.e.</i> , undisturbed) grassland conditions or areas that differ in climate from the grassland regions crossed by the Project (for example, Steen 2015 is specific to the Cariboo region north of the Project, which is an area that is both cooler and wetter than the grasslands crossed by the Project). Baseline surveys for the Project conducted to date indicate that grasslands crossed by the Project are moderately altered, with an average cover of 20-34% bunchgrasses and 18% bare ground (range is 0% to 70%). In addition, middle grasslands crossed by the Project have been previously noted as mid-seral due to historic grazing practices (Lloyd <i>et. al.</i> 2005). Trans Mountain has re-evaluated the measurable target for regenerating vegetation in arid regions and has reduced the maximum percent cover of bare ground to better align with baseline information. The target has been revised. Different targets for the different years of PCEM will not be used because factors that influence establishment and growth are site-specific and a range of percent cover following seeding is common. Examples of factors that can affect vegetation cover are microsite moisture conditions, the aspect of the site, seasonal weather patterns (extended cool or unseasonal high temperatures in spring) and drought conditions. Instead, the targets are designed to be achievable within the five-year PCEM timeframe. If at any point during the five-year PCEM program performance indicators are found to be underperforming and unlikely to meet the measurable target by year five, corrective measures will be implemented.	Section 6.0

TABLE A-3 Cont'd

Invited Stakeholder Group/Agency Name	Method of Contact	Date of Consultation Activity	Feedback/Stakeholder Response	Trans Mountain Response	Where Addressed in the Plan
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 3.1 Ecology and Project Effects</u> The plan notes that typical prey species may be displaced during construction activities, prey abundance is unlikely to be affected as a result of Project construction. However, if construction is during the maternal or hibernation stage for prey species the impact may be different and the plan should acknowledge this potential effect. The primary prey species for badgers (marmots and ground squirrels) eat forbs and not insects and seeds as noted in this section of the plan (Rich Weir, personal communication). This section should indicate from Symes (2013) how many winter burrows badgers tend to use, for example, in the middle part of the winter they tended to use 2-3 winter burrows. Or, at least this section should clearly indicate the difference in badger movement in summer and winter as this information lays the context for different survey windows depending on badger activity at different times of the year.	This information has been added to Section 3.1.	Section 3.1
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 3.1 Ecology and Project Effects</u> This section notes that the "short-term sensory disturbance and resultant reduced habitat effectiveness or changes in movement (avoidance) for badgers associated with pipeline construction are likely to be minimal". This needs additional rationale, how was minimal determined? The analysis should take into account the size of the disturbance and the extent that badgers are impacted. We agree that the impacts are short-term, but there should be additional rationale as to why the impacts are minimal (<i>i.e.</i> , not an automatic just because they are short-term). When talking about maternal burrows in this section it would help to provide details such as these are the burrows used to rear kits between March and July.	Short-term sensory disturbance and resultant reduced habitat effectiveness or changes in movement (avoidance) for badgers associated with pipeline construction are likely to be minimal based on Project scheduling and implementation of mitigation measures such as the following: maintaining a tight construction spread and constructing the pipeline in a well-organized and efficient manner to limit the duration of sensory disturbance, leaving gaps in set-up and welded pipe to reduce barriers to movement, limiting the length of open trench and the time that the trench is left open. Section 3.1 will further elaborate that maternal dens are used to rear kits. This comment notes the dates of "March and July", however, this is inconsistent with BG OGC's comment that the natal denning period begins in April.	Section 3.1
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 4.0: Wildlife Field Work</u> Some brief additional details should be added to describe how they narrowed down the area of overlap with critical habitat. For example, were all grassland, pastures, and open forest sites included? Are there examples of the types of areas that were excluded? Similarly, were any additional parameters used or was it primarily identification of open non-forested habitats? A map would be helpful following this section instead of listing the kilometer posts. In addition, the proponent could use the habitat models found in Weir <i>et al.</i> 2003 to better delineate important ecosystem units for badgers in the Thompson region. This would involve creating a predictive model using averaged parameters for data in the VRI and soils base data.	Further detail on how the early draft critical habitat for American badger was narrowed has been added to Section 4.0. A predictive model will not be prepared at this time and instead the focus will be on the identification of badger burrows.	Section 4.0
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 4.0: Wildlife Field Work</u> The plan notes that 11 of 12 burrows did not show evidence of recent use; however, it can be extremely difficult to determine if a burrow is active and some active burrows may appear inactive (Rich Weir, personal communication). This comment becomes important when determining whether burrows are active during construction and see comments on Section 5.3.	Qualified wildlife biologists determined that 11 of the 12 burrows did not show evidence of recent use and Trans Mountain is confident with these results. A member of the field crew included a retired senior employee of BC MOE that has extensive experience with American badger ecology and burrow identification.	Section 4.0
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.0 Mitigation, Section 5.1 Avoid</u> Section 5.1.1 indicates that Trans Mountain's focus is on identifying and avoiding active badger burrows. Many of our comments relate to strengthening this aspect of the plan. In Section 5.1.2, there is a least risk window of July 15 to October 15, but for badgers there should still be some due diligence during this time as badgers are still present. Either in this section or in Section 3.1, the plan should add a note that by mid-July female badgers with kits are moving around more frequently and do not have true maternal burrows as well as referencing Table B-2 (now Table A-2). Overall, the plan needs to more clearly set the framework for what is required at different times of the year for badgers. Some suggestions include: July 15 to October 15 - During the least risk window there should be pre-construction sweep for burrows and determination if they are active. This can be done directly ahead of construction and buffers could be less than for maternal burrows. Badgers move around more during this period and therefore, burrows are unlikely to remain active for a substantial period of time. Environmental inspectors will have to complete pre-construction sweeps for during the breeding bird window and the Rattlesnake and Gophersnake Plan indicates there will be a pre-construction survey if construction occurs in the snake active season. Therefore, there are opportunities to conduct searches for burrows at the same time. Also, see comments in Section 6.0 of the EPP on Badger Surveys including that a summary table of all possible pre-construction surveys would be helpful (Volume 2). Maternal Period - The plan should include the dates for this period and indicate exactly when surveys will be done if construction occurs during this window. Though March/early April is the ideal time for surveys, there may be >1 maternal burrow and so surveys should be timed such that the current maternal burrows are captured by surveys. As well, see comments on Section 5.3 regarding how it may be difficult to distinguish maternal burrows from other burrows and the need to evaluate if burrows are active and if they are maternal.	Trans Mountain appreciates this feedback to strengthen the Plan and to clarify the mitigation. Trans Mountain will use this information to more clearly lay-out the framework related to mitigation during different times of the year, specifically in Table 2.	Sections 3.1 and 5.3 (Table 2)
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.0 Mitigation, Section 5.2 Minimize and Restore On-site</u> The proper handling of soil and the soils contingency plans are one of the most important considerations for badgers. The plan does a good job of addressing this concern, but the plan should note the high importance of these mitigation / restoration measures for this species.	The importance of mitigation measures as they relate to maintaining soil characteristics that allow for digging (where present prior to construction) will be emphasized.	Section 5.2
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.3: Mitigation and Habitat Restoration Measures</u> Table 3 (now Table 2): *Education and Awareness - Will the environmental education include identification of badger burrows during construction and if so it should clearly indicate who will receive the training. There is an existing PDF on identifying badger burrows that could be used as part of this training. The plan should provide some brief details on what training will include. Badger burrows are a feature that construction crews could be educated on to identify. Also, flagging crews that are out ahead of construction could contribute to identifying burrows directly ahead of construction.	The Project has an Environmental and Compliance Education Program. More detail on this program is provided in Section 4.3 of the Pipeline EPP. This training will include information on wildlife species at risk, including American badger. The environmental education and awareness training will include a species at risk component Although the details of the training are not detailed in this Plan, the Environmental and Compliance Education Program will include information on badger ecology, badger identification, and guidelines for identifying active and inactive burrows.	Section 5.3 (Table 2)

TABLE A-3 Cont'd

Invited Stakeholder Group/Agency Name	Method of Contact	Date of Consultation Activity	Feedback/Stakeholder Response	Trans Mountain Response	Where Addressed in the Plan
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.3: Mitigation and Habitat Restoration Measures</u> Table 3 (now Table 2): Scheduling - As noted above female badgers may move to a different maternal den after the initial maternal or natal den. The timing of pre-construction surveys should be such that the currently occupied dens are identified even though March/April is the best time to view burrows. Scheduling - As noted under Section 5.1, there needs to be some due diligence (e.g., pre-construction sweeps) for badgers during the least risk window. Scheduling - There should be some description of the steps that will be taken to determine if dens are active. The plan needs to indicate what methods will be used to determine if burrows are active and methods to evaluate the use of any active burrows that are found (e.g., remote cameras). The plan should recognize that maternal burrows only tend to have a larger soil fan after they have been used for some time (approximately a month or more) and so there should be additional actions to determine if an active burrow is a maternal burrow or not. Scheduling - This section seems to suggest that a Specialist monitoring the den for disturbance would be used instead of a buffer? We support the use of a buffer around maternal dens until they are not active. If an alternative to a buffer is being proposed, the plan needs to more clearly describe and rationalize how the Wildlife Specialist would ensure there is no disturbance. In addition, this section uses the word 'may' and the wording needs to be such that mitigation that will be employed if an active den is located. Scheduling - There is nothing in this section around buffers for burrows during the active season or winter burrows. All of this information should be in the same place whether it is in this section or in the 'Species Disturbance During Construction' section below.	Trans Mountain appreciates this feedback to strengthen the Plan and to clarify the mitigation. Trans Mountain will use this information to more clearly lay-out the framework for pre-construction sweeps and mitigation during different times of the year.	Section 4.1
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.3: Mitigation and Habitat Restoration Measures</u> Table 3 (now Table 2): Species Disturbance During Construction - The plan needs to provide further details for what would happen if a burrow is encountered during construction including initial steps, determining occupancy, buffer distances etc. This is a key part of the plan and need to include more details.	This comment is consistent with previous comments regarding the identification of active badger burrows, determining active and inactive burrows and implementing appropriate buffers. With incorporation of other edits to clarify this information, this comment will be addressed and clarified in the Plan.	Section 5.3 (Table 2)
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.3: Mitigation and Habitat Restoration Measures</u> Table 3 (now Table 2): Traffic Management and Access Management - There should be speed limits and signage whenever an active burrow is located. This relates to comments under 5.3 Species Disturbance During Construction and may be part of that section.	Speed limits will be in place along access roads and the construction right-of-way to reduce the potential for collisions with wildlife. This measure is meant to be implemented regardless of the discovery of a burrow in vicinity of the Project. Trans Mountain believes this mitigation is adequate as written in Section 5.3 (Table 2).	Section 5.3 (Table 2)
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.3: Mitigation and Habitat Restoration Measures</u> Table 3 (now Table 2): Habitat Restoration - There is a plan for marmots but why was there no corresponding plan for Columbian ground squirrels?	Marmot burrows are often associated with cover objects such as coarse woody debris and rock piles. A habitat restoration/enhancement measure was therefore specifically included. Columbian ground squirrels are associated with open habitat and soils suitable for digging. The mitigation measures for American badger (soil handling, decompaction, restoration, seasonal timing) in Section 5.3 (Table 2) also serve to mitigate Project effects for Columbian ground squirrels.	Section 5.3 (Table 2).
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 5.3: Mitigation and Habitat Restoration Measures</u> Figure 1: The figure notes that "Mitigation will be reviewed and approved by the Environmental Inspector with guidance from a Wildlife Resource Specialist." for when an active badger burrow or prey colony is found. However, relevant mitigation measures should be included in this plan before construction begins and relates to several comments already from Table 3 [now Table 2] in Section 5.3.	Additional information has been added to Table 2 to provide greater clarity on the actions to be implemented.	Section 5.3 (Figure 1)
BC MFLNRO – Okanagan Region, Ecosystems	Email	February 1, 2017	<u>Section 6.0, Measuring Mitigation and Restoration Success</u> In Table 4 (now Table 3), one of the main goals is to avoid mortality of badger during construction. This comment links to my comments under Section 5.3. It is not clear in the plan who is going to be trained to and identify badgers/burrows and who is going to be actively looking for badgers during construction. Therefore, it will be difficult to assess whether this goal has been met.	The Environmental and Compliance Education Program (Section 4.3 of the Pipeline EPP) provides greater detail on who receives training. In this case, Environmental Inspectors and Contractors working in areas with potential to encounter badger burrows will have the appropriate training.	Sections 4.1 and 5.3 (Table 2)
Robyn Reudink, Ecosystems Biologist, BC MFLRNO – Thompson/ Okanagan Region	Webinar presentation	February 16, 2017	Trans Mountain hosted a webinar to review the draft NEB Condition 44 Plans, as requested by BC MFLNRO. BC MFLRNO requested detail on how residual effects would be quantified and how information from additional surveys would be incorporated into the Plans and provided to Project Contractors.	Refer to the response regarding residual effects above.	Sections 6.0 and 8.0

3.2.3 Feedback on the Plan from ECCC

ECCC provided feedback on the Plan on May 12, 2017 (Table A-4) and the same feedback was provided to the NEB in a letter dated June 16, 2017 (ECCC Comments to Mitigation and Management Plans, NEB Filing ID [A5S0T7](#)).

TABLE A-4
SUMMARY OF REGULATORY CONSULTATION ACTIVITIES
RELATED TO AMERICAN BADGER (MAY 12, 2017)

Name and Title	Method of Contact	Comments	Trans Mountain Response or Comment	Where Incorporated in Plan
ECCC	Email	No concerns are noted with respect to the approach taken with a mitigation hierarchy to avoid disturbing or harming individuals and residences during construction, and considering rerouting and ultimately revegetation to maintain open vegetation with non-compacted soils through areas of existing native grassland or pasture. Those are the habitats most likely to be used by small mammal prey, and those sites have been identified along the Project Footprint. ECCC also agrees to use techniques to discourage re-occupation of badger dens in a stockpile location between July 15 and October 15. Badgers are resilient to this kind of disturbance, and may possibly benefit from the open corridors created by pipeline rights of way that then serve dispersal functions for both prey and badgers.	No comment necessary.	N/A

3.3 Aboriginal Engagement

Since April 2012, Trans Mountain has engaged with Aboriginal communities that might have an interest in the Project or have Aboriginal interests potentially affected by the Project, based on the proximity of their community and their assertion of traditional and cultural use of the land along the pipeline corridor to maintain a traditional lifestyle. The objectives of Aboriginal engagement are to:

- have an open, transparent and inclusive process that seeks to exchange information in a respectful manner;
- address concerns shared by those who might have an interest in the Project or have Aboriginal interests potentially affected by the Project;
- incorporate feedback into Project planning and execution; and
- provide opportunities to maximize Project benefits to Aboriginal communities and Aboriginal groups.

A comprehensive Aboriginal engagement process is led by experienced engagement advisors in Alberta and BC, specialized in the areas of Aboriginal relations, law, economic development, education, training, employment and procurement. Trans Mountain's engagement process for the Project is flexible, allowing each community and group to engage in meaningful dialogue in the manner they choose and in a way to meet their objectives and values.

Each community had the opportunity to engage with Trans Mountain, depending on Project interests and potential effects. The following opportunities to engage have been provided:

- Project announcement;
- initial contact with Aboriginal community or Aboriginal group;

- meetings with Chief and Council and meetings with staff;
- host community information session(s);
- conduct TLU studies and socio-economic interviews;
- identify interests and concerns; and
- identify mitigation options.

Issues and concerns specific to wildlife species at risk, including American badger, raised during Aboriginal engagement between early 2012 to July 2017 are summarized in Table A-5 (note that the Table below is focused on species at risk and thus does not include issues or concerns that are generally related to wildlife or wildlife habitat).

TABLE A-5

SUMMARY OF ABORIGINAL CONCERNS RELATED TO WILDLIFE SPECIES AT RISK

Issue or Concern		Summary Trans Mountain Response	Where Addressed
Summary	Aboriginal Group		
Effects on species at risk	Adams Lake Indian Band Canim Lake Band (Tsq'escen') Coldwater Indian Band (Nlaka'pamux Nation) Lower Nicola Indian Band (Nlaka'pamux Nation) Neskonlith Indian Band Nicola Tribal Association (Shackan Indian Band, Nooaitch Indian Band, and Nicomen Indian Band) Shackan Indian Band (Nlaka'pamux Nation) Musqueam First Nation Lheidli-T'enneh First Nation Lhtako Dene Nation	NEB Condition 44 requires Trans Mountain to file Wildlife Species at Risk Mitigation and Habitat Restoration Plans for each species whose draft, candidate, proposed, or final critical habitat is directly or indirectly affected by the Project. NEB Condition 92 requires Trans Mountain to report on updates under the SARA of any new Schedule 1 listings or new or amended Recovery Strategies, Action Plans and Management Plans for species that have potential to be affected by the Project. Available least risk work windows and setback guidelines provided by available and relevant guidelines and best management practices to mitigate Project effects on wildlife species at risk.	7.2.10.1 and 7.2.11 of Volume 5A of the ESA Pipeline EPP (Volume 2 of the Environmental Plans) Resource-Specific Mitigation Tables (Volume 7 of the Environmental Plans) Wildlife Management Plans (Section 6.0 of Volume 6 of the Environmental Plans)
Effects on provincially red and blue listed species found in the Project area that Skeetchestn Indian Band and Tk'emlups te Secwépemc (Kamloops) uses for ceremonial and spiritual purposes as well as for food, medicine, ecological indicators, clothing, stories and trade.	Skeetchestn Indian Band Tk'emlups te Secwépemc (Kamloops)		
Effects on species at risk including, great horned owl (noted in Project area), American badger, Lewis's woodpecker, and Williamson's sapsucker.	Nicomen Indian Band Shackan Indian Band (Nlaka'pamux Nation)		
Effects on American badger, which is designated as endangered under SARA, was not included in the list of wildlife key indicator species in the Project ESA.	Lower Nicola Indian Band (Nlaka'pamux Nation)		

TABLE A-5 Cont'd

Wetlands, night bird counts, wildlife and new patches of sweetgrass in the right-of-way (how to protect them). Ermineskin would like to confirm if cultural sites and medicinal plant sites are on or off the project footprint.	Ermineskin First Nation	Measures to protect wildlife and wildlife habitat within the Project Footprint are addressed in the EPPs, specifically the Pipeline EPP (Volume 2 of the Environmental Plans), Resource Specific Mitigation Tables (Volume 7 of the Environmental Plans), the Wildlife Species of Concern Encounter and Discovery Contingency Plan Appendix B of the Pipeline EPP). Trans Mountain will review the Environmental Alignments Sheets with Ermineskin Cree Nation and provide an overview of cultural sites and medicinal plant sites on the project footprint.	Not applicable to American badger. General wildlife mitigation is provided in the other plans listed.
Issues and concerns regarding wildlife and plants	Métis Nation of Alberta Gunn Metis Local #55	Measures to protect wildlife and wildlife habitat within the Project Footprint are addressed in the EPPs, specifically the Pipeline EPP (Volume 2 of the Environmental Plans), Resource Specific Mitigation Tables (Volume 7 of the Environmental Plans), the Wildlife Species of Concern Encounter and Discovery Contingency Plan Appendix B of the Pipeline EPP).	Not applicable to American badger. General wildlife mitigation is provided in the other plans listed.

Trans Mountain continues to liaise with Indigenous and Northern Affairs Canada, the GoC's Major Projects Management Office, the BC Ministry of Aboriginal Relations and Reconciliation, and the Alberta Ministry of Aboriginal Affairs to provide updates regarding Trans Mountain's engagement activities with Aboriginal groups.

Identifying Aboriginal Groups for Consultation

Trans Mountain used the First Nations Consultative Area Database Public Map Service to identify the Aboriginal groups with traditional territories that cross early draft critical habitat for American badger. Listed below are the Aboriginal groups identified for consultation. Throughout regular engagement with TMEP, any Aboriginal groups were added to the list if they identified American badger or their habitat as a concern:

- Adams Lake Indian Band;
- Ashcroft Indian Band (Nlaka'pamux Nation);
- Boothroyd Indian Band (Nlaka'pamux Nation);
- Boston Bar First Nation (Nlaka'pamux Nation);
- Canim Lake Indian Band (Tsq'escen');
- Whispering Pines to Clinton Indian Band/Whispering Pines First Nation;
- Coldwater Indian Band (Nlaka'pamux Nation);
- Cook's Ferry Indian Band (Nlaka'pamux Nation);
- Lower Nicola Indian Band (Nlaka'pamux Nation);
- Lytton First Nation (Nlaka'pamux Nation);
- BC Métis Federation;
- Métis Nation BC;
- Neskonlith Indian Band;

- Nicola Tribal Association (Shackan Indian Band [Nlaka'pamux Nation], Nooaitch Indian Band [Nlaka'pamux Nation], and Nicomen Indian Band);
- Oregon Jack Creek Band (Nlaka'pamux Nation);
- Simpcw First Nation;
- Siska Indian Band (Nlaka'pamux Nation);
- Skeetchestn First Nation;
- Skuppah Indian Band (Nlaka'pamux Nation);
- Spuzzum First Nation (Nlaka'pamux Nation); and
- Tk'emlups te Secwepemc (Kamloops).

Consultation Activities

A letter was sent to the Aboriginal groups listed above with a copy of the draft Plan in September 2016 and the final Plan in June 2017. Additionally, a copy of the final Plan was sent to BC Métis Federation and Métis Nation BC in July 2017. Where appropriate and upon request, a follow up meeting was arranged to discuss this Plan in more detail and address any concerns. No feedback specific to this Plan has been received to date.

Trans Mountain has summarized the feedback received through Trans Mountain's engagement on this Plan and wildlife species at risk in Table A-4 and the summary includes how Trans Mountain responded to and addressed the concern or issue. It should be noted that although the engagement process also provided for opportunities for general discussion about Project construction and associated Aboriginal issues and opportunities; only feedback/issues directly related to American badger and wildlife species at risk are provided in this Plan. Other issues and topics raised have been captured in the corresponding mitigation plan as appropriate. This updated Plan will be shared with the Aboriginal groups at the same time as it is filed with the NEB in 2017.

3.4 Landowners/Tenants

Trans Mountain has implemented a comprehensive landowner engagement process for the TMEP to:

- ensure landowners are informed of the Project and how it may affect them;
- enable landowners to gain an understanding of their rights under the *NEB Act*, and the regulatory process and their opportunities for comment within the NEB regulatory process; and
- have a number of opportunities to discuss the Project, identify my concerns or questions they may have with the project, and have those questions and concerns addressed by Trans Mountain.

In addition to these opportunities for engagement, Trans Mountain is required to provide formal notifications of landowners under Sections 87 and 34 of the *NEB Act*, and Trans Mountain has or will, at the appropriate time, provide such notices.

Individual landowners and tenants have different preferences with respect to communications, and Trans Mountain tailors its communications as requested. Land representatives working for Trans Mountain have been in discussions with landowners for over three years and issues or concerns raised with land agents have been documented in the Project landowner database, addressed within site-specific construction plans and documented within the land rights agreements. Trans Mountain has filed reports with the NEB providing details on the landowner engagement program and results to date. In accordance with NEB Condition 99, records of engagement and consultation with landowners and tenants will be filed with the

NEB at least two months prior to commencing construction and every six months thereafter until five years after commencing Project operations.

Trans Mountain's landowner/tenant consultation strategy includes the activities described below.

1. Prior to Project approval - obtain landowner permission for survey, provide information on the project and landowner rights, provide copies of land agreement documents to the landowners for their review and consideration, dialogue with each landowner to answer questions and address concerns raised by landowners, provide Project updates, and disseminate any other information necessary to satisfy landowner requests and regulatory requirements. After addressing outstanding questions and issues, obtain land agreements from landowners voluntarily. Land agreements have and will address specific landowner concerns regarding construction and reclamation activity.
2. After obtaining a Certificate of Public Convenience and Necessity from the NEB, Trans Mountain will provide Section 34 notices indicating the detailed route for the pipeline and the specific lands affected by the Project, and complete any additional regulatory procedures required prior to commencement of construction, including providing reasonable notice through land agents of commencement date and activities. Trans Mountain land representatives will continue to maintain contact with landowners through construction to answer questions and address any issues that may arise. Following construction, maintain communication with landowners to discuss reclamation activities and timing. Upon completion of reclamation, Trans Mountain will transition the Project land program to operations.

Respecting this Plan, Trans Mountain notified landowners by letter in September 2016 that NEB Condition plans were being released for consultation and feedback. The landowner notification letter requested that landowners review the plans available on the TMEP website, or alternatively contact their assigned land representative or Trans Mountain directly if they wished to receive hard copies of the plans to review. No responses or requests for copies of the plans were received by Trans Mountain and no concerns or questions about the plans were expressed by landowners.

APPENDIX B

SUMMARY OF TEK AND TLU ACTIVITIES COMPLETED WITHIN TRADITIONAL TERRITORIES THAT CROSS EARLY DRAFT CRITICAL HABITAT FOR AMERICAN BADGER

Aboriginal Traditional Territory	Wildlife Field Studies TEK Participation	TLU Participation
Adams Lake Indian Band	None	Funding for a Traditional Land and Resource Use (TLRU) study has been discussed but the parties have been unable to reach agreement.
Ashcroft Indian Band	None	TLRU study not requested by Ashcroft Indian Band.
BC Métis Federation	None	TLU study not requested by BC Métis Federation.
Boothroyd Indian Band	None	TLRU study not requested by Boothroyd Indian Band.
Boston Bar First Nation	None	Joint third-party TLRU underway with Siska Indian Band, Coldwater Indian Band and Cooks Ferry Indian Band.
Canim Lake Indian Band	None	Canim Lake Indian Band conducted a TLU map review on May 1, 2013; TLU interviews and overflight on October 9, 2013; ground reconnaissance on October 10, 2013 and had their results review mitigation meeting on November 5, 2013.
Clinton Indian Band/Whispering Pines First Nation	None	Clinton Indian Band/Whispering Pines First Nation has requested confidentiality in its engagement in the project.
Coldwater Indian Band	None	Joint, third-party TLRU underway with Siska Indian Band, Boston Bar First Nation and Cooks Ferry Indian Band. Independent, third-party TLU and Traditional Knowledge Study of Coldwater Indian Reserve #1 and Preliminary Ethnographic and Historic Overview and Traditional Use Study were filed confidentially with the NEB on May 27, 2015. Originally written in February 2015, updated April 2015. Independent, third-party Preliminary Ethnographic and Historic Overview and Traditional Use Study received and filed as evidence with the NEB on May 27, 2015.
Cook's Ferry Indian Band	None	Joint, third-party TLRU underway with Siska Indian Band, Coldwater Indian Band and Boston Bar Indian Band.
Lower Nicola Indian Band	None	Independent, third-party TLRU study complete. Final report received on November 12, 2014.
Lytton First Nation	None	TLRU study not requested by Lytton First Nation.
Métis Nation BC	None	Independent, third-party expansion report. Final report was received on May 23, 2014.
Neskonlith Indian Band	None	Funding for a TLRU study has been discussed but the parties have been unable to reach agreement.
Nicola Tribal Association (Shackan Indian Band, Nooaitch Indian Band and Nicomen Indian Band)	June 12 to 14, 2013	Joint TLRU study with Shackan Indian Band, Nicomen Indian Band and Nooaitch Indian Band led by Nicola Tribal Association. Interim report received on February 17, 2014. Final report received July 15, 2014.
Oregon Jack Creek Band	None	TLRU study not requested by Oregon Jack Creek Band.
Simpco First Nation	June 2 to 15, 2013 August 13 to 16, 2013	Independent, third-party TLU study complete. Final report received on June 2, 2014.
Siska Indian Band	None	Joint, third-party TLRU underway with Coldwater Indian Band, Boston Bar First Nation and Cooks Ferry Indian Band.
Skeetchestn First Nation	None	Joint third-party Cultural Heritage Study underway with Tk'emlúps te Secwépemc. Additional TLRU information received and filed as evidence with the NEB on May 27, 2015.
Skuppah Indian Band	None	TLRU study not requested by Skuppah Indian Band.
Spuzzum First Nation	None	TLRU study not requested by Spuzzum First Nation.
Tk'emlúps te Secwépemc	None	Joint third-party Cultural Heritage Study underway with Skeetchestn Indian Band. Additional TLRU information received and filed as evidence with the NEB on May 27, 2015.

APPENDIX C

RECORD OF STAKEHOLDER NOTIFICATIONS OF PLAN

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Landowners	N/A	September 11, 2016	Letter
Aboriginal Groups (please refer to Appendix A)	N/A	September 26, 2016	Letter
Vancouver Fraser Port Authority	Tim Blair	September 20, 2016	Email
Jasper National Park of Canada	Mayabe Dia	September 20, 2016	Email
Alberta Environment and Parks	Corinee Kristensen	September 20, 2016	Email
Ministry of Transportation and Infrastructure	Lisa Gow	September 20, 2016	Email
BC Parks	Ken Morrison	September 20, 2016	Email
BC OGC	Brian Murphy	September 20, 2016	Email
Ministry of Natural Gas Development	Linda Beltrano	September 20, 2016	Email
Forests, Lands and Natural Resource Operations	Andrea Mah	December 22, 2016	Email
Forests, Lands and Natural Resource Operations	Susan Fitton	September 20, 2016	Email
Fraser Valley Air Quality Coordinating Committee	Roger Quan	October 21, 2016	Email
ECCC	Phil Wong	October 21, 2016	Email
ECCC	Rachel Mayberry	October 28, 2016	Email
ECCC	Coral Deshield	December 21, 2016	Email
ECCC	Phil Wong	December 21, 2016	Email
Vancouver Fraser Port Authority	Patrick Coates	September 20, 2016	Email
Department of Fisheries and Oceans	Sandra Hollick-Kenyon	December 3, 2016	Email
Department of Fisheries and Oceans	Alston Bonamis	December 3, 2016	Email
City of Edmonton	N/A	September 19 to 23, 2016	Letter
City of Spruce Grove	N/A	September 19 to 23, 2016	Letter
Municipality of Jasper	N/A	September 19 to 23, 2016	Letter
Parkland County	N/A	September 19 to 23, 2016	Letter
Strathcona County	N/A	September 19 to 23, 2016	Letter
Town of Edson	N/A	September 19 to 23, 2016	Letter
Town of Hinton	N/A	September 19 to 23, 2016	Letter
Town of Stony Plain	N/A	September 19 to 23, 2016	Letter
Village of Wabamun	N/A	September 19 to 23, 2016	Letter
Yellowhead County	N/A	September 19 to 23, 2016	Letter
City of Kamloops	N/A	September 19 to 23, 2016	Letter
City of Kamloops RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Kamloops Hotel Association	N/A	September 19 to 23, 2016	Letter
Kamloops Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Kamloops Ministry of Jobs, Tourism, Skills Training	N/A	September 19 to 23, 2016	Letter
City of Merritt	N/A	September 19 to 23, 2016	Letter
City of Merritt RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Clearwater Employment Services	N/A	September 19 to 23, 2016	Letter
Tourism Wells Grey	N/A	September 19 to 23, 2016	Letter
Clearwater Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
District of Clearwater	N/A	September 19 to 23, 2016	Letter
District of Clearwater RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Interior Health	N/A	September 19 to 23, 2016	Letter
Merritt Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Northern Health	N/A	September 19 to 23, 2016	Letter
Regional District of Fraser Fort George	N/A	September 19 to 23, 2016	Letter
Thompson Nicola Regional District	N/A	September 19 to 23, 2016	Letter
Town of Blue River	N/A	September 19 to 23, 2016	Letter
Venture Kamloops	N/A	September 19 to 23, 2016	Letter
Village of Valemout	N/A	September 19 to 23, 2016	Letter
Village of Valemout RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Valley District	N/A	September 19 to 23, 2016	Letter
Valemout Learning Centre	N/A	September 19 to 23, 2016	Letter

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Work Skills BC - Valemount	N/A	September 19 to 23, 2016	Letter
Valemount and Area Recreational Development Association	N/A	September 19 to 23, 2016	Letter
Valemount Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Grassland's Conservation Council	N/A	September 19 to 23, 2016	Letter
Abbotsford Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Abbotsford Police Department	N/A	September 19 to 23, 2016	Letter
Abbotsford Soils Conservation Association	N/A	September 19 to 23, 2016	Letter
BC Invasive Species	N/A	September 19 to 23, 2016	Letter
BC Ministry of Children and Family Development	N/A	September 19 to 23, 2016	Letter
BC Ministry of Social Development	N/A	September 19 to 23, 2016	Letter
BC Nature	N/A	September 19 to 23, 2016	Letter
BC Wildlife Federation	N/A	September 19 to 23, 2016	Letter
Burnaby Board of Trade	N/A	September 19 to 23, 2016	Letter
Burnaby RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Chilliwack Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Chilliwack Economic Partners	N/A	September 19 to 23, 2016	Letter
City of Abbotsford	N/A	September 19 to 23, 2016	Letter
City of Burnaby	N/A	September 19 to 23, 2016	Letter
City of Chilliwack	N/A	September 19 to 23, 2016	Letter
City of Coquitlam	N/A	September 19 to 23, 2016	Letter
City of New Westminster	N/A	September 19 to 23, 2016	Letter
City of Port Coquitlam	N/A	September 19 to 23, 2016	Letter
City of Port Moody	N/A	September 19 to 23, 2016	Letter
City of Surrey	N/A	September 19 to 23, 2016	Letter
Coquitlam RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Corporation of Delta	N/A	September 19 to 23, 2016	Letter
District of Hope	N/A	September 19 to 23, 2016	Letter
Eagle Creek	N/A	September 19 to 23, 2016	Letter
Fraser Valley Invasive Plant Council	N/A	September 19 to 23, 2016	Letter
Fraser Valley Regional District	N/A	September 19 to 23, 2016	Letter
Glen Valley Watershed Society	N/A	September 19 to 23, 2016	Letter
Hope Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Hope Community Policing Office	N/A	September 19 to 23, 2016	Letter
Langley Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Langley Environmental Partners Society	N/A	September 19 to 23, 2016	Letter
Lower Fraser Valley Air Quality Coordinating Committee	N/A	September 19 to 23, 2016	Letter
Metro Vancouver	N/A	September 19 to 23, 2016	Letter
Newton RCMP Detachment	N/A	September 19 to 23, 2016	Letter
RCMP Division 'E'	N/A	September 19 to 23, 2016	Letter
Sapperton Fish and Game	N/A	September 19 to 23, 2016	Letter
Stoney Creek	N/A	September 19 to 23, 2016	Letter
Surrey Board of Trade	N/A	September 19 to 23, 2016	Letter
Surry Environmental Partners	N/A	September 19 to 23, 2016	Letter
Surrey RCMP Detachment	N/A	September 19 to 23, 2016	Letter
Township of Langley	N/A	September 19 to 23, 2016	Letter
Township of Langley RCMP Detachment	N/A	September 19 to 23, 2016	Letter
TriCities Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Upper Fraser Valley Regional Detachment	N/A	September 19 to 23, 2016	Letter
Village of Anmore	N/A	September 19 to 23, 2016	Letter
Village of Belcarra	N/A	September 19 to 23, 2016	Letter
Yorkson	N/A	September 19 to 23, 2016	Letter
ACGI Shipping	N/A	September 19 to 23, 2016	Letter
Barnett Marine Park	N/A	September 19 to 23, 2016	Letter
BC Ambulance	N/A	September 19 to 23, 2016	Letter
BC Chamber of Shipping	N/A	September 19 to 23, 2016	Letter
BC Coast Pilots	N/A	September 19 to 23, 2016	Letter
BROKE (Burnaby Residents Opposed to KMC Expansion)	N/A	September 19 to 23, 2016	Letter

Regulator/Stakeholder Group	Contact Name (if applicable)	Date	Method of Contact
Canadian Pacific Rail	N/A	September 19 to 23, 2016	Letter
Canexus- Ero- Newalta-Univar Community Advisory Panel	N/A	September 19 to 23, 2016	Letter
Canexus Chemicals	N/A	September 19 to 23, 2016	Letter
Chevron	N/A	September 19 to 23, 2016	Letter
Canadian National Rail	N/A	September 19 to 23, 2016	Letter
Council of Marine Carriers	N/A	September 19 to 23, 2016	Letter
District of North Vancouver	N/A	September 19 to 23, 2016	Letter
Empire Shipping	N/A	September 19 to 23, 2016	Letter
Erco Worldwide	N/A	September 19 to 23, 2016	Letter
First Nation Emergency Services Society	N/A	September 19 to 23, 2016	Letter
First Nation Health Authority	N/A	September 19 to 23, 2016	Letter
Fraser Health Authority	N/A	September 19 to 23, 2016	Letter
Inchcape Shipping	N/A	September 19 to 23, 2016	Letter
Island Tug and Barge	N/A	September 19 to 23, 2016	Letter
Kask Brothers	N/A	September 19 to 23, 2016	Letter
Ledcor Resources and Transportation Limited Partnership	N/A	September 19 to 23, 2016	Letter
Mason Agency (Shipping Service)	N/A	September 19 to 23, 2016	Letter
Member of the Legislative Assembly (MLA) – Burnaby Lougheed	N/A	September 19 to 23, 2016	Letter
MLA – Burnaby North	N/A	September 19 to 23, 2016	Letter
MLA – Coquitlam and Burke Mountain	N/A	September 19 to 23, 2016	Letter
MLA - North Vancouver Lonsdale	N/A	September 19 to 23, 2016	Letter
MLA – North Vancouver Seymour	N/A	September 19 to 23, 2016	Letter
MLA – Port Moody - Coquitlam	N/A	September 19 to 23, 2016	Letter
Member of Parliament (MP) – Delta	N/A	September 19 to 23, 2016	Letter
MP – North Burnaby Seymour	N/A	September 19 to 23, 2016	Letter
MP – North Vancouver	N/A	September 19 to 23, 2016	Letter
MP – Vancouver Centre	N/A	September 19 to 23, 2016	Letter
MP – Vancouver East	N/A	September 19 to 23, 2016	Letter
MP – Vancouver Quadra	N/A	September 19 to 23, 2016	Letter
MP – West Vancouver – Sunshine Coast – Sea to Sky Country	N/A	September 19 to 23, 2016	Letter
North Shore NOPE	N/A	September 19 to 23, 2016	Letter
North Vancouver Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Pacific Coast Terminal	N/A	September 19 to 23, 2016	Letter
Pacific Pilotage Authority	N/A	September 19 to 23, 2016	Letter
Pacific Wildlife Foundation	N/A	September 19 to 23, 2016	Letter
Peter Kiewit Infrastructure Co.	N/A	September 19 to 23, 2016	Letter
Seaspan	N/A	September 19 to 23, 2016	Letter
Shell Terminal	N/A	September 19 to 23, 2016	Letter
Simon Fraser University	N/A	September 19 to 23, 2016	Letter
SMIT Marine	N/A	September 19 to 23, 2016	Letter
Suncor Terminal	N/A	September 19 to 23, 2016	Letter
UBC Stellar Sea Lion (Marine Mammal) Research Centre	N/A	September 19 to 23, 2016	Letter
Vancouver Aquarium	N/A	September 19 to 23, 2016	Letter
Vancouver Board of Trade	N/A	September 19 to 23, 2016	Letter
Vancouver Coastal Health Authority	N/A	September 19 to 23, 2016	Letter
Vancouver Pile and Dredge	N/A	September 19 to 23, 2016	Letter
West Vancouver Chamber of Commerce	N/A	September 19 to 23, 2016	Letter
Westward Shipping	N/A	September 19 to 23, 2016	Letter
Wild Bird Trust	N/A	September 19 to 23, 2016	Letter
Metro Vancouver Regional District	Ali Ergudenler	September 19 to 23, 2016	Email
Metro Vancouver Regional District	Roger Quan	September 19 to 23, 2016	Email