Environmental Management Plan V.2
Alaska Highway No. 97 and Swanson Lumber Road
Signalization Project

Ministry of Transportation and Infrastructure
Project No. 37387
# Revision History and Approvals

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Disclaimer

This report is rendered solely for the use of the Ministry of Transportation and Infrastructure (MOTI) in connection with Alaska Highway No. 97 & Swanson Lumber Road Signalization Project (the Project), and no person may rely on it for any other purpose without Triton Environmental Consultants Ltd.’s prior written approval. Should a third party use this report without Triton’s approval, they may not rely upon it. Triton accepts no responsibility for loss or damages suffered by any third party as a result of decisions made or actions taken based on this report.

- The objective of this report is to provide an Environmental Management Plan (EMP) for MOTI in relation to the above noted project.
- This report is based on facts and opinions contained within the referenced documents, including the results of any data collection programs carried out in relation to this report. We have attempted to identify and consider facts and documents relevant to the scope of work, accurate as of the time period during which we conducted this analysis. However, the results, our opinions, or recommendations may change if new information becomes available or if information we have relied on is altered.
- The following assumptions were relied on during the preparation of this report:
  - MOTI will require the successful construction contractor to provide a Construction EMP (CEMP) prior to starting works.
- We applied accepted professional practices and standards in developing and interpreting data. While we used accepted professional practices in interpreting data provided by MOTI or third party sources, we did not verify the accuracy of any such data.
- This report must be considered as a whole; selecting only portions of this report may result in a misleading view of the results, our opinions, or recommendations.
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1.0 Introduction

1.1 Project Description

The BC Ministry of Transportation and Infrastructure (MoTI) is conducting a highway improvement project, which will include the addition of turning lanes and signals at the intersection of Highway 97 (Alaska Highway) and Swanson Lumber Road (Road 259; the Project). The site is located approximately 5.5 km south of Fort St. John, BC (Figure 1). Activities will include, but are not limited to, clearing and grubbing, culvert removal/abandonment, installation of four, 1200 mm culverts, road widening, and other associated road construction works. Construction is scheduled to occur in the summer/fall of 2019.

Triton Environmental Consultants Ltd. (Triton) was retained by MoTI to assist with environmental services related to the Project. Triton conducted a preliminary site visit, prepared an environmental overview report (Triton 2017), and developed this Environmental Management Plan (EMP).

1.2 Scope of Work and Relevant Documents

An EMP is an action plan that outlines and details environmentally sensitive aspects of the project and provides mitigation and monitoring measures aimed at reducing or eliminating environmental impact at all levels of a project or activity.

This EMP has been developed for MoTI to guide, and provide recommendations for, the construction project. It will be submitted as part of the tender package and it is expected that the successful Contractor will produce a separate Construction Environmental Management Plan (CEMP) to demonstrate knowledge of the environmental sensitivities and outline their construction approach. This EMP will address the following items:

- Scope of work and an overview of the project sequencing and schedule
- Environmental sensitivities and timing windows
- Erosion and sediment control measures
- Clearing and grubbing procedures
- Construction waste management protocol
- Air quality and dust control
- Spill contingency
- Environmental monitoring requirements
- Environmental Procedures

The Contractor’s CEMP may use this EMP as a reference and may expand on general recommendations provided therein. Since CEMPs are dynamic documents, it is expected that revisions/addendums by the Contractor will be required as construction progresses.
Environmental legislation relevant to the Project includes, but is not limited to the following:

Federal Legislation

- *Canadian Environmental Protection Act*
- *Migratory Birds Convention Act*
- *Species at Risk Act*

Provincial Legislation

- *Water Sustainability Act*
- *Environmental Management Act*
- *Wildlife Act*
- *Heritage Conservation Act*
- *Weed Control Act*

Best management practices (BMPs), guidance documents, and other documents that are relevant to this project include:

- Province of British Columbia. 2017. Working Around Water;
- BC Ministry of Environment. n.d. Fish and Fish Habitat Protection Best Management Practices for Bridge, Ditch and Road Maintenance Activities within the Peace Region; and
• Triton Environmental Consultants Ltd. 2017. Highway 97 - Swanson Road Intersection Aquatic and Terrestrial Resources Assessment. Prepared for the Ministry of Transportation and Infrastructure, Northern Region.
Figure 1. Project Location Map
2.0 Environmental Setting

2.1 Aquatic Resources

An aquatic and terrestrial overview assessment was completed by Triton in 2017. According to the online aquatic mapping sources completed for the assessment, the proposed highway project crossed two mapped watercourses. However, field assessments determined one of the mapped watercourses to be a dry swale and not a stream as defined by the Water Sustainability Act, and the second mapped watercourse was classified as an S4D; it is located near Station 100+620 and will not be affected by construction as per the drawings provided in Appendix 5.

A number of culvert crossings were identified within the project footprint and are associated with private driveways, not stream crossings. Depending on the time of construction, some standing water may be present.

One wetland area was noted during the field assessment on the north side of the highway. It is a beaked sedge-water sedge marsh (Wm01) site association found in wet swales and depressions (MacKenzie and Moran, 2004). It was dry at the time of the assessment, but standing water may be present depending on the time of construction.

2.2 Terrestrial Resources

2.2.1 Vegetation

The vegetation observed on the cleared ROW consisted predominantly of grasses, herbs, and shrubs that have an affinity for disturbed sites such as dandelion, clovers, and rose. Most of the land adjacent to Highway 97 (east and west) through the Project area is privately owned and has been partially developed for agricultural purposes. Ditchlines were vegetated with grasses, sedges, and herbaceous plant communities. Where forested (west side of Swanson Road), trembling aspen (Populus tremuloides) dominated the canopy adjacent to the cleared ROW with scattered spruce.

There is no significant new or additional vegetation clearing anticipated beyond brushing of the existing ROW; however, a few mature trees may need to be removed around the fence line of the property on the southeast side. Should additional vegetation clearing be required, a nest sweep would be required if the activity is to be carried out during the nesting/breeding season (see Section Error! Reference source not found. Timing Windows and Section Error! Reference source not found. Clearing and Grubbing Plan for further information).

Noxious weeds and invasive plants located within, or near, the Project area include: common sow-thistle (Sonchus oleraceus), Canadian thistle (Hordeum jubatum), and curled dock (Rumex crispus; Triton 2017). Best Management Practices (BMPs) for invasive plant management (Section Error! Reference source not found.) should be adhered to.
2.2.2 Wildlife

The project area provides marginal foraging opportunities for Mule Deer (Odocoileus hemionus) and Moose (Alces americanus), as some browse was evident in adjacent shrub communities during the assessment (Triton 2017). It is anticipated that some mammals are likely to use the project area since the upland forest provides shelter and forage, and the adjacent agricultural fields provide additional grazing habitat. The majority of adjacent habitat outside of the ROW is cleared agricultural land or upland forest where foraging is expected to occur.

Amphibian habitat within the project area is limited to the observed wetland areas and the drainage ditches when they have water present. Although no amphibian species were observed in these areas at the time of overview assessment, there is a potential for possible use (Triton 2017). It is recommended that a Qualified Environmental Professional (QEP) conduct a search for amphibians prior to construction within potential occurrence areas.

2.3 Archaeological Resources

The Ministry completed a detailed Archeological Impact Assessment for the Project with no archeological sites identified within the Project area.

In the event that additional items with potential cultural significance are encountered within the project footprint, the crew will immediately notify the Ministry Onsite Representative and the appropriate agencies (BC Archaeological Branch, phone 250-953-3334). Works will not resume within 30 m of the potential archaeological site until instructed by the Ministry Representative. A copy of MoTi’s chance find procedure can be found within the contract documents.

If suspected significant palaeontological remains or archaeological or historical objects are encountered, the following chance find management procedures will be implemented by the crew immediately:

- Stop work in the immediate vicinity of the suspected find. Do not undertake further work that could disturb the immediate vicinity of the suspected find site, including the transport of soil or rock to or from the immediate vicinity of the site.
- Flagging of the area to identify it as a no-go zone.
- Site Supervisor will contact the Ministry’s Representative.

2.4 Regulatory Aspects

2.4.1 Permits

Based on the results of the aquatic and terrestrial overview assessment, only one stream is present within the construction footprint. However, based on the 100% design drawings,
this area is within the clear and grub limit, but no actual changes to the culvert or banks are expected; therefore, permits under the Water Sustainability Act will not be required. The Ministry has obtained an amphibian salvage permit under the Wildlife Act should amphibians need to be relocated during construction. The Contractor will be responsible for any other permits that may be required.

2.4.2 Timing Windows

Since no streams are likely to be affected by the construction; no instream work windows apply.

Clearing and grubbing should be scheduled outside the bird nesting window to avoid contravention of the Wildlife Act. If clearing is required between April 25 and August 20, a bird nest survey shall be performed by a Qualified Environmental Professional (QEP) following the MOTI breeding bird nest survey protocol (Appendix 4) to identify occupied nests and provide recommendations (Hussel and Lepage 2015). If active nests are encountered, a buffer must be established, and construction activity should be adjusted to avoid the area until it is confirmed the animals have fledged/left the nest.
3.0 Erosion and Sediment Control Plan

As a component of the EMP, an Erosion and Sediment Control Plan (ESCP) must be prepared for the project to be in compliance with Section 165: Protection of the Environment (MoTI 2016a and 2016b). The ESCP must be prepared prior to the commencement of any construction activities and be accepted by the Ministry Representative. The main objective of the ESCP is to minimize the introduction of sediment into drainage areas and to the surrounding vegetation. Erosion and sedimentation are major concerns with respect to their potential impact on the environmentally sensitive areas. The contractor will be responsible for planning, scheduling, and performing the work in such a manner that the quality of surface water flowing from the site meets Provincial water quality guidelines. Water quality testing is further described in Section Error! Reference source not found. of this plan.

3.1 Expected Site Conditions

The climate in the region is generally dry and relatively warm compared to other surrounding biogeoclimatic zones. Winters are cold (average temperature of −12°C) and summers are cool with mean temperatures around 15°C. The annual precipitation in the Fort St. John area is 292 mm and the annual snowfall is 190 cm (ECCC 2018). Precipitation in the form of rainfall (of most concern for erosion control) typically increases through spring with the majority of rainfall accumulating between May and September (Error! Reference source not found.). Major rain events (e.g., > 10 mm in one day) are uncommon, but one or two events per month should be anticipated between May and September. This will need to be considered during the preparation of the ESCP, throughout all phases of construction, and when demobilizing from site to ensure it is left in a stable condition.

Table 1. Average precipitation for Fort St. John calculated from data collected between 1981 and 2010 (ECCC 2018)

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<th></th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
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3.2 Risk Assessment

A preliminary risk assessment was completed for the project area as per Section 4 of the TAC National Guide to Erosion and Sediment Control on Roadway Projects (referred hereafter as the TAC Guide). The Project area was evaluated based on construction works, weather, and topography to determine the potential for erosion. The type of soils in the area are not known; therefore, a medium erodibility rating has been assumed. The slopes in the Project area will be constructed at a 4:1 slope and the overall length will be less than 10 m. Overall the erosion potential in these areas is considered low. Due to the proximity to the unnamed creek and wetland, the existing drainage ditches, and an overall moderate soil erodibility ranking, the erosion potential should be considered moderate for the Project.

As outlined in Table 4.3 of the TAC Guide, the required elements of the ESCP at this site should contain the following BMPs:

- Procedural BMPs (with staged construction)
- Erosion Control BMPs
- Sediment Control BMPs
- Water Quality Monitoring

The proper implementation of BMPs should follow Appendix F of the TAC Guide as well as DFO Land Development Guidelines for the Protection of Aquatic Habitat (Chilibeck et al., 1993).

3.3 Procedural BMP’s

Procedural BMPs are non-structural methods and procedures that can reduce erosion and sediment transportation on site. They can be used to coordinate construction activities and BMP implementation. The general principles of erosion and sediment control that will be followed include:

- Scheduling construction to minimize the risk of erosion;
- Retaining existing vegetation where possible;
- Close-cutting and not grubbing as many areas as possible;
- Only stripping areas that will be worked on within a short timeframe; do not strip the entire work area at one time as this increases the erosion risk;
- Constructing fill and waste areas by selective placement to avoid erosive surfaces;
- Not disturbing existing embankments or embankment protection where possible;
- Re-vegetating or covering disturbed areas as soon as possible;
- Directing runoff away from disturbed areas (swales);
- Minimizing the length and steepness of slopes where possible;
- Minimizing runoff velocities and erosive energy;
- Inspecting and maintaining sediment and erosion control structures; and
- Promptly implementing corrective measures as necessary.

### 3.4 Erosion Control BMP’s

Erosion control BMPs are required where exposed soils are present to prevent sediment transport to environmentally sensitive areas (unnamed $S4D$). Examples of erosion controls are provided in Table 7-3 of the TAC Guide. Implementing erosion control measures such as those listed below, should help reduce the dependency on sediment control measures:

- Seeding and/or mulching any disturbed areas as soon as possible. Also, placing of seed and mulch by hand will help provide protection from rainfall and can be done quickly to provide immediate cover.

- Providing and maintaining temporary measures which may include, but are not limited to, sand bags, silt fences, geotextiles, polyethylene sheeting, water pumps, spill kits, straw bales, drainage swales, ditches, drains, temporary drainage piping, sedimentation basins, vegetative cover, and other construction required to prevent erosion and migration of silt, mud sediment and other debris off site or to other areas of the site where damage may result.

- Locating stockpiled materials away from concentrated flows. Stockpiled areas should be monitored after storm events and sediment fencing may be required if erosion and sediment transport is observed. The existing vegetation cover should be retained around the stockpiles to assist with runoff filtration. Seeding and mulching of stockpiled material should be completed as soon as possible. Stabilization will include roughing of the surface by using the excavator bucket to create grooves in the soil that run parallel to the contours. The area can be seeded (by hand if the area is small) using annual fall rye and mulched using straw bales. Areas that will be disturbed again within 21 days should be covered with tarps to temporarily minimize rainfall and dust erosion.

- The location of onsite waste disposal areas will be confirmed prior to use. Recommendations for the maximum height and slopes will be discussed and the CEMP must outline erosion and sediment control measures to ensure containment of these areas. In general, seeding and mulching should be completed in a progressive manner. If any areas of the project are not considered complete and will be exposed over a weekend or overnight, they should be covered with poly to prevent erosion from rainfall events.

- As per Drawing R3-310-702, erosion control matting will be installed along the newly created ditchline to Station 30+123.362. Specifications of this matting can be found on Drawing R3-310-306.
• The layout of additional site-specific erosion control measures will be based on site inspections, construction activities, and evaluation of the ESC measures performance.

3.5 Sediment Control BMP’s

Sediment control BMPs are required in areas where there is potential for water to mobilize sediment and to prevent this sediment-laden water from leaving the site. Sediment control measures are intended to filter or settle sediment-laden water and encourage water infiltration to the ground. Examples are provided in Table 7-4 of the TAC Guide.

For this project, the following sediment control measures will be implemented, and others may be utilized depending on changing site conditions:

• Areas of high traffic (i.e., access points and where abundant clays exist) will become very muddy during rain events. This material could be exchanged for gravels which are more porous to allow for proper drainage. Road sweepers should be considered to remove accumulated materials from access points to help prevent tracking to other areas.

• If natural vegetation is not an adequate filter, silt fencing will be used around stockpiles to help prevent runoff from leaving the disposal areas. It will also be used at the toe of slopes or along contours. It will not be used within ditch lines as it is not designed for use under flow. It will be trenched in and additional stakes will be installed should more support be required.

• Additional site-specific sediment control measures will be based on site inspections, construction activities, and evaluation of the measures’ performance.

3.6 Inspecting, Monitoring, and Maintaining ESC Features

All ESC features will be inspected daily by the contractor and by the Environmental Monitor (EM). To ensure erosion and sediment control BMPs are functioning as intended, maintenance activities will include the following:

• Accumulated sediment resulting from construction activity on adjoining surfaces, drainage systems, and watercourses will be removed, and damage caused by soil erosion and sedimentation will be repaired. For example, if groundwater seepage is experienced in the isolated site during instream works, the turbid water will be pumped into adjacent vegetation for filtration. Hose discharge points will be frequently checked and relocated as needed to prevent scouring.

• Silt fences will be assessed for functionality and any which are at risk of failure or are failing will be replaced. Silt fences that are no longer required for ESC purposes will be removed and re-used or properly disposed of. Silt fences will not be left in place indefinitely.

When sediment of debris accumulation exceeds 30 cm on the fencing, the materials will be cleaned out.
3.7 **Site Specific Erosion and Sediment Controls**

Site-specific erosion and sediment controls will be adapted as construction progresses and site conditions change. These will be outlined in the CEMP as the construction approach will dictate which controls will be best suited to the site.

3.8 **Water Quality Monitoring**

Water quality monitoring may or may not be required depending on the flow levels and construction approach at the time of construction. Given the nature of the work, suspended sediment will be the primary water quality parameter of concern and will be the focus of the sampling. There is also a possibility of hydrocarbon contamination given the close proximity of equipment to the unnamed stream and runoff from existing road surfaces.

At a minimum, when water quality monitoring is required, it will involve daily visual inspections, and measurements of turbidity (suspended solids), pH, temperature, and conductivity will be collected. Water quality monitoring will be conducted if the discharge water quality is noticeably different from the background values. The water quality monitoring plan will be a requirement of the CEMP which will outline sampling locations and frequency. Water quality guidelines for the protection of aquatic life are outlined in *Error! Reference source not found.*.

**Table 2. Summary of water quality guidelines for turbidity, suspended and benthic sediments (Caux et al. 1997)**

<table>
<thead>
<tr>
<th>Maximum Induced Turbidity (NTU) or % of Background</th>
<th>Maximum Induced Suspended Sediments or % of Background</th>
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<tbody>
<tr>
<td>Change from background of 8 NTU for a duration of 24 hours during clear flows</td>
<td>Change from background of 25 mg/L for a duration of 24 hours during clear flows</td>
</tr>
<tr>
<td>Change from background of 2 NTU for a duration of 30 days during clear flows</td>
<td>Change from background of 5 mg/L for a duration of 30 days during clear flows</td>
</tr>
<tr>
<td>Change from background of 5 NTU when background is 8 to 50 NTU</td>
<td>Change from background of 10 mg/L when background is 25 to 100 mg/L</td>
</tr>
<tr>
<td>Change from background of 10% NTU when background is &gt;50 NTU</td>
<td>Change from background of 10% NTU when background is &gt;100 mg/L</td>
</tr>
</tbody>
</table>

3.9 **Ancillary Sites**

Ancillary sites for this project are not known at this time (e.g., site office, equipment staging); however, a quarry/gravel pit may be required to provide material onsite. If any Ministry pits are used, Pit Development Plans will be followed. The site used will be reviewed by the EM during site visits to ensure potential erosion or invasive plant issues are addressed.

There may also be onsite waste material stockpile areas at either end of the construction limits within the right of way boundary. Erosion and sediment control measures must be incorporated as material is placed in these locations.
3.10 Inclement Weather

In general, construction activities will be completed in such a manner as to minimize the risk of negative environmental impact and timed to avoid forecasted heavy rain events. The Site Supervisor, in consultation with the Ministry, shall cease operations, modify construction methods, or relocate to an alternative site within the project area during periods of inclement weather to avoid siltation that cannot be properly treated. During periods when the work is suspended due to inclement weather, the EM or designate will monitor the site and, when required, will implement mitigative measures to control silt-laden runoff.

Should the Project require a winter shut-down period, it is recommended that the Contractor provide a Winter Stabilization Plan as part of the Construction Environmental Management Plan or as a separate submission at least 1 month in advance of winter shut down. This plan should include the following items: contact information, environmental monitoring plan, general and site-specific erosion and sediment control measures, implementation schedule, and a contingency supply list.
4.0 CEMP Required Plans

While the contractors' CEMP must contain the following plans, high level mitigation measures for each have been provided in the following sections.

4.1 Clearing and Grubbing

A Clearing and Grubbing Plan must be prepared as part of the CEMP. Should vegetation clearing be required between April 10 and September 10, a bird nest survey is required to ensure the protection of birds and avoid contravention of the Wildlife Act. Clearing activity may occur up to the limits outlined in the project drawings, or as specified by the Ministry Representative and in accordance with Sections 165 and 200 of the MoTI Standard Specifications for Highway Construction. Volume 1 (MoTI 2016a). Clearing limits should be visibly staked or flagged by the contractor prior to commencing clearing operations.

The Clearing and Grubbing Plan should lay out the schedule for clearing activity and discuss BMPs to reduce the likelihood of negative environmental impacts as a result of clearing. This should include close-cutting of vegetation where possible and retention of root masses and topsoil salvage to replace/replant after construction. Erosion and sediment control measures should be implemented immediately following clearing and grubbing activity. Care will be taken to protect and preserve all vegetation outside of the clearing boundary; if disturbed, the contractor will replace such vegetation.

4.2 Invasive Plant Management

Noxious weeds and invasive plants are located within the Project area and include Canada thistle, curled dock, and common sow-thistle. BMPs to ensure that invasive plants and/or noxious weeds are not spread or propagated throughout the construction zone could include:

- Discussion of management of noxious weeds and invasive plant measures during the onsite kick-off meeting;
- Washing all equipment clean of soil, seeds, and plant parts prior to entering the project site at the start of the Project; all equipment will be inspected for soil/seeds/plant parts when the Project is completed;
- Minimizing soil disturbance and re-vegetating disturbed areas as quickly as possible;
- If possible, locating staging and lay down areas such that they are not located in infested areas; and
- Ensuring straw (mulch) sources are certified weed-free, and are visually inspected prior to application to ensure no invasive plant seeds are present. Hay shall not be used as mulch unless it is from a local area demonstrated to be free of invasive species.
4.3 Wildlife Management

Wildlife may experience short-term effects as a result of disturbance from construction activities and avoid the Project area. However, the Project is not expected to have any long-term effects on populations in this area. Wildlife will likely avoid areas of construction activity; however, if wildlife such as bears, deer, or moose are observed near, or within the worksite, they should be avoided, and construction should halt in the immediate area until the individual has left the area. Wildlife sightings should be immediately reported directly to the Ministry Representative. Any aggressive behaviour by wildlife toward the construction crew will result in work shutdown until the problem is resolved. Harassment of wildlife will not be tolerated and crews will be made aware of this during safety meetings.

4.4 Waste Management

4.4.1 Construction Waste

Preparation of a Waste Management Plan must be included within the CEMP. The plan must address construction waste (including domestic wastes) and hazardous waste, outlining measures and procedures for temporary on-site storage, removal, and disposal of materials; particularly the removal and disposal of the old culverts. All wastes are to be removed from site and disposed of at an approved facility that meets all Federal, Provincial, Regional, and Municipal bylaws and regulations.

The contractor will reduce, reuse, and recycle construction materials and maintain a clean work site at all times. Waste, whether from construction or domestic sources (i.e., litter and garbage) will be disposed of in appropriate bins, and will not be burned, buried, or disposed of onsite. Construction and domestic wastes shall be kept separate, with food waste disposed of in bear-proof trash cans that are regularly emptied and hauled away to designated landfill or transfer stations. Construction wastes will be stored in appropriate bins and removed from the site when required. Should wildlife issues arise, the EM will make recommendations to improve the waste management systems used on-site.

4.4.2 Hazardous Waste

If material is discovered or generated onsite that is believed to be contaminated or hazardous, the owner (MoTI) will be notified immediately and operations potentially ceased depending on the size of the area. If the hazardous material is stable and does not pose an immediate threat, the owner may determine the appropriate course of action for removal or neutralization of the hazardous material. If the hazardous material poses an immediate threat and is unstable, then spill response procedures should be immediately followed in order to contain the hazardous material.

4.4.3 Concrete

Based on information provided at the time of this report, the use of concrete to plug culverts that are going to be abandoned is anticipated. Leachate from concrete is toxic
and is considered a deleterious substance, any concrete works will be conducted in a manner that prevents leachate from entering the wetland area or unnamed stream. If concrete is going to be used, a Concrete Management Plan must be created, or the mitigation procedures and methods may be provided as an Environmental Procedure within the CEMP. At a minimum, the Concrete Management Plan should address procedures and mitigation measures to reduce the chance of spills to watercourses or drainages, concrete disposal, and washing of tools/equipment used during the works.

4.5 **Air Quality and Dust Control**

Vehicle and equipment emissions and fugitive dust dispersal are the primary sources of potential negative air quality associated with the Project. In order to reduce effects, the following mitigation measures are proposed.

4.5.1 **Emission Reduction Strategies**

Implementation of innovative and practical idle reduction strategies are encouraged to reduce emissions from the Project. Idle reduction strategies fall into four groups:

- Location of staging areas to minimize impact of emissions;
- Idling time reductions (construction vehicles and equipment);
- Outreach and communication (as part of site orientation); and
- Idle reduction technologies.

Given the limited number of heavy equipment needed and spatial extent of the work area, it is anticipated that the construction supervisor can effectively limit idling and limit equipment operation to only those units necessary for the tasks at hand.

4.5.2 **Dust Control Strategies**

Depending on the timing of construction, there is a potential for dust generation from vehicle and equipment movement may occur. As the main roads are paved, dust control strategies will be applicable to any other exposed soil areas and private, gravel driveways that will experience high traffic volume.

Dust control can be achieved by spraying roads, work sites, and stockpiles with water or a dust suppressant/soil binder. Dust dispersal from wind erosion can be mitigated by completing soil stripping and grading activities during appropriate weather conditions (i.e., during calm weather) and in a timely manner to expedite the spreading of less erodible materials, and by stabilizing exposed soils with seed and mulch. Wind erosion of exposed soils in storage piles can be minimized by covering soil piles with fabric or polyethylene or using a windscreen to reduce wind speed and decreases movement of particulates. Spraying water or a dust suppressant on soils to form a crust creates a surface less susceptible to wind erosion. It is recommended that water be brought to the site by a water truck contractor. If local, surface water is to be used, a short-term water use licence (Section 10 of the Water Sustainability Act) will be required.
If a dust suppressant, such as calcium chloride, is going to be used, MoTI will ensure it is not applied near or within ESAs and will follow Section 4.1 Dust Control and Base Stabilization of Environmental Best Practices for Highway Maintenance Activities (MoTI 2018).

### 4.6 Spill Contingency and Response

The Spill Contingency Plan is based on the requirements listed in Section 165 of Standard Specifications for Highway Construction (SS165.13.01 to 165.13.04, SS165.14.01 to 165.14.05; MoTI 2016a). These Standard Specifications should be consulted in addition to the Spill Contingency Plan outlined below. All spills will be reported directly to the EM. For incidents that occur when the EM is not on site, the Site Supervisor will provide detailed information to the EM.

#### 4.6.1 Potential Spill Sources

Potential sources of spills that could occur during construction activities are:

- Leaking or ruptured fuel tanks; for this Project, these will most likely be pickup-mounted tidy tanks;
- Spills during refuelling of vehicles and equipment; and
- Leaks from equipment or ruptured hoses.

Sections 4.6.2 through 4.6.6 summarize methods to avoid and mitigate such situations.

#### 4.6.2 Site-Specific Measures for Spill Prevention and Containment

The spill response planning will focus on prevention and containment. The following site-specific controls will be implemented and maintained throughout the Project:

- The contractor will provide spill kits at all refuelling, lubrication, repair locations, and within heavy equipment for immediate response to spills. Spill kits will be capable of capturing 125% of potential spill volumes.
- All on-site staff will be knowledgeable about hazardous material storage, handling requirements, and spill kit location and deployment.
- All vehicles and machinery will be refuelled 30 m away from any watercourse or sediment control facility. Fuel must be properly stored in clean Transport Canada approved tidy-tanks or in approved secondary containment facilities. Fuel storage tanks over 250 L (not anticipated to be required) must be equipped with auto shutoff valves. Small fuel tanks must be stored within diked containment areas on stable storage racks. The on-site fuel storage site, if required, will be diked to contain 125% of the total storage capacity. The area will be lined with an impermeable layer and water accumulation will be removed as necessary.
- All small fuel storage containers, such as 200 L drums, shall be installed on a stable storage rack in an impermeable containment device capable of capturing at least 125% of the total capacity of the storage container.
• A cover, such as a tarp, must be placed over the top of the fuel cache to prevent accumulation of precipitation in the containment device.

• To prevent vandalism during periods of inactivity (if applicable), all fuels, lubricants, and toxic substances will be stored in locked structures.

• All waste fuel or products such as filters will be secured in spill-proof containers and discarded at an approved facility.

• Drainage water from areas of work will be channelled into established sumps to provide containment in the event of a spill.

4.6.3 Spill Kit Contents and Locations

During all phases of the Project, all heavy equipment will be equipped with a spill kit, which generally contains:

• 15 to 20 absorbent universal or hydrophilic pads (for water-based substances);

• 15 to 20 absorbent hydrophobic pads (for hydrocarbons);

• 2 disposable bags;

• Nitrile gloves and eye protection (goggles);

• 3 containment booms;

• Laminated instruction sheets; and

• Plug and dyke kit to plug punctured drums or tanks.

Additionally, there will be a barrel spill kit onsite at all times and immediately accessible in the event of a significant spill. A barrel spill kit typically contains the following items:

• 9”x9” absorbent pillows

• Polyethylene rope

• 15 m of 3” containment booms

• Sandbags

• 12’x18’ tarps

• Disposable bags

• 30 lb oil sponge

• 18”x18” absorbent pads

• Nitro gloves

• 18”x18” antifreeze pads

• Goggles

• 45 gallon drum

• Patch sticks/plug-in dyke

• Laminated instruction sheet

4.6.4 General Spill or Leak Practices and Procedures

In the event of a spill or leak during construction, the following spill or leak practices should be implemented:

• Do not touch or walk through spilled material.
• Stop the flow safely and quickly (if possible).
• Shut off machinery, pumps, valves, etc.
• Plug leaks (if possible).
• Remove or right containers.
• Do not smoke or use cell phones in the spill area.
• Prevent spilled materials from flowing away from the initial spill site or from flowing into a watercourse, creek, or any drainage ditches or catch basins.
• Eliminate all ignition sources.
• If possible, turn leaking container so that gas escapes rather than liquid.

4.6.5 Cleanup Practices and Procedures

In the event of a spill, the following Spill Response Procedures will be implemented. Procedures will vary depending on the product and spill location.

• Consult the EM or Site Supervisor as required.
• Ensure appropriate personal protective equipment is worn during spill cleanup work. Consult Safety Data Sheets (SDS) for safety and environmental information specific to the spilled substance.
• For product spills and leaks on soil, liquid will be collected using absorbents and the soiled absorbent materials will then be transferred into a drum or other sealed container. The contaminated soil will be excavated and drummed or otherwise contained. Drums of waste will be labelled to identify their contents and stored in a spill containment area (location to be determined by the Site Supervisor and EM) prior to being hauled off-site for disposal by a certified hauler to an authorized dumpsite for contaminated materials.
• For product spills into the watercourse, absorbent booms will be placed to prevent the spilled product from flowing downstream. Absorbent materials will be used to recover floating product.
• Pictures will be taken of the cleanup activities for filing/reporting purposes.
• All used spill kits and associated materials will be replaced on the job site as soon as possible.

4.6.6 Spill Investigation/Report Form

Reportable emergencies include those such as Class 3 and Waste Oils (e.g., 100 L or greater for discharge to ground of gasoline, diesel, or lubricants) and any spill to open water. In the event of a spill, the response procedure will be as follows:

• Notify the EM
• Complete an investigation and spill response form (Triton example provided in Appendix 1) and submit to the MoTI Environmental Representative within 24 hours of the incident
• Contact Emergency Management BC (1-800-663-3456) if it is of reportable levels

The investigation and spill response form must be prepared by the company responsible for the spill and include:

• A general description of the incident;
• A drawing of the site showing the area of the spill;
• Pictures of the spill, damages (if any), and cleanup efforts;
• Source and cause of the incident;
• Description of the response effort;
• Quantity of the spill and percent recovered;
• Itemized cleanup costs;
• Recommendations for preventative and mitigation measures; and
• Plans for upgrading emergency preparedness and response plans.

4.7 **Environment Monitoring**

4.7.1 **Environmental Monitor Responsibilities**

The contractor will retain the services of an Environmental Monitor (EM) that meets the requirements of an Appropriately Qualified Professional as per SS165.01.02 (MoTI 2016a) and any relevant contract documents. The EM will be available throughout the Project to represent the contractor in matters pertaining to the environment; responsibilities should include, but may not be limited to:

• Updating and distributing the CEMP as necessary;
• Attending a project pre-construction meeting;
• Conducting a pre-work meeting prior to works and informing the Site Supervisor of key environmental issues;
• Reviewing work plans to ensure compliance, and making recommendations to resolve any non-conformances;
• Monitoring work activities as they relate to environmental protection;
• Assisting with site isolation as needed;
• Distributing copies of incident reports and other environmental occurrence documents to the appropriate agencies;
• Conducting regular inventories of spill response kits;
• Preparing field notes and photographs describing the progress of the work, any environmental issues that arise, and mitigation measures that are used to resolve the issue (Triton example provided in Appendix 2);

• Preparing correspondence related to environmental monitoring, as required;

• Liaising with agencies in the event of an environmental incident or the development of unforeseen site conditions with the potential to result in a significant impact;

• Suspending or altering work if an environmental emergency or incident occurs. This may also occur during periods of inclement weather where erosion and sedimentation risks may be higher; and

• Overseeing site cleanup and restoration activities.

4.7.2 Bi-Weekly Environmental Report

A bi-weekly report summarizing the environmental monitoring events over a 14-day period will be produced for the duration of the Project unless an alternate schedule is approved by the Ministry Representative. The bi-weekly report will be modified as needed during the Project, but it will likely contain:

• A description of work activities;

• Environmental monitoring activities;

• Identified environmental issues and corresponding mitigation measures implemented;

• Results of any testing of environmental attributes as they become available; and

• Photographs (accompanied by identifying information such as date, location) documenting construction activities, environmental issues, and corresponding mitigation measures.

4.7.3 Environmental Incident Reporting

An environmental incident is defined as an event, act, or omission that is, or has, the potential to cause a violation of any of the Environmental Requirements. Examples of Environmental Incidents include, but are not limited to:

• Spills of oil, fuel, hazardous chemicals;

• Unauthorized discharges of deleterious substances into fish-bearing water bodies;

• Unauthorized alteration, disruption, or destruction of aquatic or terrestrial habitat;

• Alteration of, or damage to, heritage or archeological resources;

• Fires related to construction activities; and

• Unauthorized release of air pollutants.
The EM is responsible for adequately documenting and providing incident reporting to the Site Supervisor. Incidents will be immediately reported to the Ministry Representative. Notes detailing an environmental incident will be documented on the environmental monitoring form (example provided in Appendix 2) and at the time of the incident. Within five working days of the Environmental Incident, a written environmental incident report will be generated that includes the following:

- Cause and nature of the incident
- Approximate magnitude and duration of the incident
- Area or habitat affected
- Environmental resources affected
- Results of any sample analysis taken in conjunction with the incident (e.g., water samples)
- Mitigation measures (preventive and corrective actions) to control or limit the activity causing the incident, including a timeframe for implementation
- Additional proposed remedial or corrective actions recommended
- Communications held with Contractor and MOTI
- Depending on the nature of the environmental incident, collection and analysis of samples may be required to characterize the extent and nature of the release
- Changes made to prevent similar events
- Reports will be available to regulators upon request
5.0 Environmental Procedures

Environmental Procedures (EP) are required for works in and around environmentally sensitive areas (ESAs). At a minimum, the EPs should adhere to all industry BMPs and DFO Measures to Avoid Causing Harm to Fish and Fish Habitat (Project Near water website). Although these should be completed by the successful Contractor to demonstrate an appropriate construction approach and can be added to the CEMP prior to construction, high level procedures are provided below.

5.1 Culvert Works

A number of existing culverts will be replaced with larger capacity culverts or will be removed. Four existing culverts located at the intersection of Highway 97 and Swanson Lumber Road, and two located near the eastern limit of construction (near STN 100+840), will remain in place and will be abandoned. It is assumed that these will be filled with a concrete slurry. Mitigative measures outlined for concrete works include:

- Any concrete waste located on the ground will be completely removed to an approved disposal site.
- Leachate is toxic and a deleterious substance, therefore, all works will be conducted to prevent leachate from entering drainages.
- The work area will be isolated from surface water with a waterproof barrier such as polyethylene sheets.
- To prevent groundwater contamination, surface water that has contact with any amount of leachate will be pumped to a treatment sump until neutralized with a carbon diffuser. Treated water from the sump can then be safely pumped to a vegetated area (i.e. adjacent mature forest) to continue filtration.

5.2 Reclamation

Exposed areas that are completed, or will remain inactive for a period of time, will be stabilized as soon as possible to reduce the potential for erosion and transport of sediment during rain events. As such, the seeding and mulching of areas will be completed as they are finished or if they will be left untouched for more than 21 days. Although Section 757 (MoTI 2016b) indicates that the North East Dryland mix should be used, a custom mix provided by MOTI (LaFramboise, pers. com. 2019) will be used instead which contains:

- Tall fescue (27%)
- Perennial ryegrass (20%)
- Rocky Mountain Fescue (28%)
- Timothy (25%)

Seed will be obtained from a certified source and meet quality assurance standards. Seed Analysis Reports/Certificates of Analysis should be forwarded to the Ministry...
Representative at least 20 working days prior to the blending of mixes and shipping of the seed from the seed supplier to the Contractor.

Disturbed areas are to be seeded either by hand, rotary spreader, or hydroseeder. Straw mulch, provided by a vendor recommended by MoTI, should also be used to protect seeds and soil from rainfall erosion and to ensure seeds are not eaten by wildlife. Other details regarding application rates will be outlined in the contract Special Provisions.

All slopes would be seeded and mulched as per Project requirements to meet Approval conditions and leave the site in a stable condition.
6.0 References


Triton Environmental Consultants Ltd. 2017. Highway 97 – Swanson Road Intersection Aquatic and Terrestrial Resources Assessment V.1. Prepared for the Ministry of Transportation and Infrastructure, Northern Region, Prince George, BC.
APPENDIX 1

EXAMPLE ENVIRONMENTAL MONITORING FORM
APPENDIX 2

EXAMPLE SPILL RESPONSE FORM
APPENDIX 3

DRAWINGS
APPENDIX 4

BREEDING BIRD NEST SURVEY PROTOCOL
APPENDIX 5

KEY PHOTOGRAPHS
Photo 1. View looking east along southern right of way towards S4D outlet

Photo 2. View looking upstream at culvert outlet at the S4D stream
Photo 3. View looking west along typical right of way conditions

Photo 4. View looking east at culverts under Swanson Road and Highway 97