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**SOLICITATION AMENDMENT**  
**MODIFICATION DE L'INVITATION**

The referenced document is hereby revised; unless otherwise  
indicated, all other terms and conditions of the Solicitation  
remain the same.

Ce document est par la présente révisé; sauf indication contraire,  
les modalités de l'invitation demeurent les mêmes.

**Comments - Commentaires**

**Vendor/Firm Name and Address**  
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V6Z 0B9

<b>Title - Sujet</b> Muncho Lake Roadside Stabilization	
<b>Solicitation No. - N° de l'invitation</b> EZ899-150742/A	<b>Amendment No. - N° modif.</b> 002
<b>Client Reference No. - N° de référence du client</b>	<b>Date</b> 2014-08-11
<b>GETS Reference No. - N° de référence de SEAG</b> PW-\$PWY-015-7289	
<b>File No. - N° de dossier</b> PWY-4-37088 (015)	<b>CCC No./N° CCC - FMS No./N° VME</b>
<b>Solicitation Closes - L'invitation prend fin</b> <b>at - à 02:00 PM</b> <b>on - le 2014-08-20</b>	<b>Time Zone</b> <b>Fuseau horaire</b> Pacific Daylight Saving Time PDT
<b>F.O.B. - F.A.B.</b> <b>Plant-Usine:</b> <input type="checkbox"/> <b>Destination:</b> <input checked="" type="checkbox"/> <b>Other-Autre:</b> <input type="checkbox"/>	
<b>Address Enquiries to: - Adresser toutes questions à:</b> Chan (PWY), Scarlett	<b>Buyer Id - Id de l'acheteur</b> pwy015
<b>Telephone No. - N° de téléphone</b> (604) 775-9382 ( )	<b>FAX No. - N° de FAX</b> (604) 775-6633
<b>Destination - of Goods, Services, and Construction:</b> <b>Destination - des biens, services et construction:</b> PWGSC - Km701.6 / Km701.9 / Km703.1 Alaska Hwy - Alaska Highway, BC	

**Instructions: See Herein**

**Instructions: Voir aux présentes**

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<b>Signature</b>	<b>Date</b>

Solicitation No. - N° de l'invitation

EZ899-150742/A

Client Ref. No. - N° de réf. du client

Amd. No. - N° de la modif.

002

File No. - N° du dossier

PWY-4-37088

Buyer ID - Id de l'acheteur

pwpy015

CCC No./N° CCC - FMS No/ N° VME

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**Les documents français seront disponibles sur demande**

Vous trouverez l'addenda n° 1 ci-joint.

Les autres conditions ne changent pas.

***The following changes/clarifications in the tender documents are effective immediately.***

***This addendum will form part of the contract documents***

This addendum is issued to provide details of PWGSC's comments from the Bidders' Conference, answer questions from potential bidders, and provide amendment to the Specifications as attached hereto.

### **PWGSC's Comments from Bidders' Conference**

The purpose of these comments is to highlight some of the construction items that are unique to this project.

1. Work Covered by Contract Documents (see Section 01 11 10 – Summary of work (pg. 1) for a high level overview description of the project). A summary includes:
  - a. The purpose of the project is to widen and stabilize the highway shoulder in 3 areas adjacent to Muncho Lake. All three areas are within 2 km of each other.
  - b. The new retaining walls shall comprise a combination of gabion mats and MSE Retaining Wall System (SierraScape or pre-approved equivalent). The locations / areas of each material type comprising the retaining wall are provided on the contract drawings. Should any changes to the locations / areas for each material type be required, pre-approved by the Departmental Representative will be required.
  - c. At areas 1 & 2 the new walls will be constructed on top of the existing gabion baskets. At area 2, the existing top row of gabions needs to be removed by the contractor prior install of the new retaining wall.
2. Owner Supplied Materials (see Section 01 11 10 – Summary of Work (pg. 3) for full descriptions). Additional details of the aggregate required on the project is found within Section 31 05 16 – Aggregate Materials (pg. 75). A summary of the owner supplied materials includes:
  - a. 19 mm Base Course (used for Gravel Shouldering and Granular Base Course) - PWGSC's Km 712 pit (already manufactured).
  - b. Structural Fill - PWGSC's Km 712 pit (19 mm material or "as is" pit run, screening / manufacture by the contractor may be required to ensure material achieves required gradation. Also note, a Standard Direct Shear Test may be required (see pg. 76 for additional laboratory testing requirements for this material type).
  - c. Facing Stone and Gabion Mat Rock Fill:
    - i. Reuse of existing gabion fill from gabions to be removed.
    - ii. PWGSC's Km 712 Pit (Note, limited quantities available, material will need to be sorted to ensure material achieves required gradation).
    - iii. PWGSC's Wood Creek Quarry (Km 650) (Note, rock has been blasted, material needs to be sorted to ensure material achieves required gradation).
    - iv. PWGSC's Km 712 Pit – "As is" Pit Run (Note, screening / manufacture required).
  - d. Riprap – PWGSC's Wood Creek Quarry (Km 650) (Note, material will need to be sorted to ensure material achieves required gradation).

3. Work Completion (see Section 01 11 10 – Summary of Work (pg. 4) for full descriptions). The key dates includes:
  - a. Commence onsite work (single land road closures) on or following September 2, 2014.
  - b. Achieve substantial performance by October 17, 2014.
4. Survey / layout of the work (see Section 01 11 10 – Summary of Work (pg. 6) and Section 01 29 00 – Payment Procedures (pg. 10) for full descriptions). A summary of the survey layout requirements include:
  - a. The contractor is responsible for all layout of the work.
  - b. Areas 1 & 2: layout of work, based on measurements from existing gabions (see dimensions and details provided on contract drawings).
  - c. Area 3: layout of work based on layout points provided surveyed from existing monuments (see layout points and monument details provided on contract drawings).
5. Quality Management (see Section 01 45 00 – Quality Management (pg. 56) for full details). Central to the Quality Management requirements is the contractor's responsibility for the completion of all Quality Control (QC) on the project. Completion of QC will at a minimum require:
  - a. Submission of an acceptable Quality Management Plan.
  - b. Testing of aggregates (including Standard Direct Shear Test (if required due to gradation of aggregate material used), gradation, densities, and survey tolerances).
  - c. Monitoring of the existing gabions and road surface throughout the work (additional monitoring details provided within Section 31 23 33 – Excavation and Backfill, pg. 86).
6. Excavation and Backfill (see Section 31 23 33 – Excavation and Backfill (pg. 85) for full details). A summary of the key tasks and requirements include:
  - a. Top row of existing gabions at Area 2 will be removed. This will result in the need to work below the Muncho Lake water level to complete excavation and install Gabion mats and SierraScape wall in select areas (up to +/- 0.5 m depending on water level at the time of the work). Backfill of SierraScape wall below water level will be with Facing Stone rather than Structure Fill.
  - b. Care shall be taken by the contractor to during excavation and log removal not to damage or disturb existing gabions or embankment slopes.
  - c. Use extreme care during excavation to limit disturbance to the highway embankment slope beyond the limits of excavation. Stop work and immediately notify the Departmental Representative if materials such as timber cribbing, wire rope, corduroy / timber logs, or other unexpected materials are encountered within the excavation.
  - d. The temporary cutslopes are the contractor's responsibility. Typical slopes of 1H:1V are shown on the construction drawings for reference only. Temporary shoring (e.g. lock blocks) or locally flatter/steeper slopes may be required depending on the conditions encountered. A Geotechnical Data Report is included within Appendix A of the specifications. The information contained within this report may be helpful to the contractor and provide insights into the material types which may be encountered within

- the excavations. Regardless of the temporary cutslopes used by the contractor, a 5.0 m wide temporary traffic lane with the required 1.0 m temporary shoulder shall be required at all times.
- e. Compaction of retaining wall backfill will require additional care to prevent damage to the existing gabions or embankment slopes below the wall. There are limitations on the size and type of compaction equipment that can be used, particularly for the zone within 3 ft (0.9 m) of the wall.
  - f. Excavation of bedrock (rock excavation) is not anticipated based upon the available geotechnical information. However if bedrock is encountered within the limits of excavation, the Departmental Representative will review and provide the contractor with further direction. This may include, alternative methods for securing the geogrid within the highway embankment. Should the alternative methods required by the contractor require additional effort; the additional effort will be completed via change order. A definition defining what will be classified as “rock excavation” is included in the specifications.
7. Retaining Wall (see Section 32 32 34 – Retaining Wall (pg. 95) for full details). One item that is unique to this project is:
- a. Wall lifts should be as straight and horizontal as conditions permit (adjust nesting depth of each SierraScape basket as required to the limits shown on the drawings).
8. PWGSC will have a Departmental Representative onsite during the work to complete inspections and monitoring the progress of the contractors work. Quality assurance and site supervision will also be provided by the Consultant, EBA.
9. Numerous submittals as detailed throughout the specifications will be required from the contractor prior to starting the work. At a minimum these submittals include:
- a. Construction Schedule
  - b. Traffic Management Plan
  - c. Quality Management Plan
  - d. Environmental Protection Plan
  - e. Health and Safety Plan
  - f. Hazardous Materials Management Plan
10. As detailed in the specifications, submittals shall be submitted to PWGSC in electronic format via PWGSC’s cloud-based OPRIMA system (login details to be provided by Departmental Representative at time of submission following contract award). Refer to pg. 19 of the specification for additional detail. If required, a tutorial will be given to the winning Contractor.
11. Contracting Authority’s Reminder Re: Insurance and Bonding Requirements: In addition to the standard Commercial General Liability insurance requirement, we also ask the winning Contractor to have the Builders’ Risk/Installation Floater coverage and Environmental Impairment Liability Insurance.

### **Questions and Answers Received from Potential Bidders**

Q1) Has the riprap material available from PWGSC's Wood Creek Quarry been sorted?

A1) No, the material has not been sorted. The rock has been blasted into varying material sizes. For information see the photos of the Wood Creek Quarry attached.

Q2) Is the fibre optic line located adjacent to the rock cut or on the lake side of the highway?

A2) The fibre optic line is located closer to the rock face than the lake and PWGSC does not anticipate encountering the fibre optic line within the excavation. However, the contractor is responsible for verifying the location of the fibre optic line prior to starting the excavation.

Q3) What are the requirements for traffic control during and following work hours when the highway is restricted to one lane alternating traffic?

A3) During working hours, 1 flagger at each end of the work zone is required. Outside of non-working hours the contractor may choose to control the single lane alternating traffic using portable traffic lights at each end of each work area (i.e. a set of traffic lights must be installed at each end of Area 1, Area 2, and Area 3 when under construction). The maximum allowable delay to traffic resulting from the need to reduce the two way highway to single lane alternating traffic is 10 min. Refer to Section 01 35 14 – Traffic Control for further details of the traffic control requirements.

Q4) Is a pilot car for traffic control required?

A4) The use of a pilot car to control the single lane alternating traffic is not specifically required. However, the contractor shall submit a Traffic Management Plan detailing the strategies proposed to accommodate and achieve all traffic accommodation requirements during the work. The contractor may choose to use a pilot car as part of the proposed strategies for traffic accommodation.

Q5) Are the hours of work restricted?

A5) There are no restrictions on the hours which the contractor can work.

Q6) Will the MFLNRO Section 9 Approval for Instream Work be provided during the tendering period?

A6) The MFLNRO Section 9 Approval for Instream Work will likely not be provided during the tendering period but rather be provided to the successful bidder following award; it is expected

to be completed not later than September 5, 2014. Should the MFLNRO Section 9 Approval for Instream Work contain additional environmental requirements resulting in additional costs to the contractor beyond the requirements outlined in the specifications, the additional costs will be covered through a change order.

Q7) Is fish salvage and/or isolation of the site from fish a requirement? The Fish Salvage permit may not be obtained in time.

A7) Fish salvage and/or isolation from the site is not specifically required. However the contractor is responsible for preparing an acceptable Environmental Protection Plan prior to starting work. This plan will need to include avoidance and mitigation measures which the contractor will undertake and implement to ensure compliance with the environmental regulations applicable to the project.

Q8) The Project is to occur between Sept 2 and Oct 24, however instream timing window for this area of the province is July 15 – August 15.

A8) PWGSC is aware of these timing windows and has decided to complete the work between September 2 and October 24 to increase the probability of having a lower water level within Muncho Lake.

Q9) How often and for how long shall the environmental monitor be onsite?

A9) The details of the contractors monitoring program shall be outlined in the Contractor's Environmental Protection Plan. The environmental monitor shall be onsite during critical times throughout the project such that all regulatory requirements and requirements of the specifications are achieved. Further details on the environmental monitoring requirements including the environmental monitors qualifications can be found within Section 01 35 43 – Environmental Protection, page 55, Section 1.23.

Q10) Will the contractor be required to isolate the site with turbidity curtains while working below the high water mark?

A10) The contractor may choose to use turbidity curtains as part of the avoidance and mitigation measures outlined in the contractors EPP to help ensure compliance with the environmental regulations applicable to the project.

Q11) Please confirm if silt fencing is not applicable due to fore shore works required (Page 54 of 99, Section 1.21.2).

A11) The requirement for silt fencing is contingent on the methods and procedures used by the contractor and described in the contractors Environmental Protection Plan. This plan shall be completed by the contractor and requires acceptance by PWGSC prior starting the work.

Q12) Page 42 of 99, Section 1.3.1, Page 43 of 99, Section 1.4.6 and again Page 46 of 99, Section 1.8.4 refers to an outdated document that has been superseded.

A12) The reference documentation - Standards and Best Practices for Instream Works (March 2004) is still valid and to the best of our knowledge has not been superseded.

Q13) Page 43 of 99, Section 1.3.7 refers to MFLNRO Section 9 Approval for instream work – please confirm this is secured as obligatory 45 day review period required.

A13) The contractor will not be responsible for obtaining the MFLNRO Section 9 Approval for Instream Work.

### **Changes to the Specifications and Contract Drawings**

#### **1. Section 01 35 43 – Environmental Protection**

##### **Delete:**

- 1.3.1 Standards and Best Practices for Instream Works, British Columbia Ministry of Land and Air Protection Ecosystem Standards and Planning Biodiversity Branch – March 2004 (Appendix B).
- 1.3.2 Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans – September 1993 (Appendix C).
- 1.3.3 Environmental Protection Plan (EPP) – Checklist (Appendix D)
- 1.3.4 Responsibility Checklist For Authorizations /Approvals / Notifications / Permitting (Appendix E)
- 1.3.5 Relevant Environmental Publications (Appendix F)
- 1.3.6 PWGSC Environmental Effects Evaluation (Provided during tender period)
- 1.3.7 MFLNRO Section 9 Approval for Instream Work (Provided during tender period)

##### **Insert:**

- 1.3.1 Standards and Best Practices for Instream Works, British Columbia Ministry of Land and Air Protection Ecosystem Standards and Planning Biodiversity Branch – March 2004 (see Reference Documentation, pg. iii).
- 1.3.2 Land Development Guidelines for the Protection of Aquatic Habitat, Fisheries and Oceans – September 1993 (see Reference Documentation, pg. iii).
- 1.3.3 Environmental Protection Plan (EPP) – Checklist (Appendix B)



- 1.3.4 Responsibility Checklist For Authorizations /Approvals / Notifications / Permitting (Appendix C)
- 1.3.5 Relevant Environmental Publications (Appendix D)
- 1.3.6 PWGSC Environmental Effects Evaluation (Provided during tender period)
- 1.3.7 MFLNRO Section 9 Approval for Instream Work (to be provided to successful bidder following award of contract)

**Insert:**

- 1.4.7 Pay specific attention to requirements of Land Development Guidelines for the Protection of Aquatic Habitat – Fisheries and Oceans (September 1993)

**Delete:**

- 1.5.1.9 Outline the avoidance and mitigate measures which the Contractor will undertake and implement to ensure compliance with the environmental regulations applicable to the project (which may include requirements provided in MOE Approval or Notifications for Instream Work, NWPA Approval for Instream Work, DFO Fisheries Act requirements, etc.) and these contract specifications.

**Insert:**

- 1.5.1.9 Outline the avoidance and mitigate measures which the Contractor will undertake and implement to ensure compliance with the environmental regulations applicable to the project (which may include requirements provided in MOE Approval or Notifications for Instream Work, NWPA Approval for Instream Work, DFO Fisheries Act requirements, all documents referenced in Section 1.3 above, etc.) and these contract specifications.

2. Section 31 23 33 – Excavation and Backfill

**Delete:**

- 2.1.1.2 All excavation areas below water level to 0.1 m above water level at the time of construction: Gabion Mat Rock Fill in accordance with Section 31 05 16 – Aggregates, wrapped with Nonwoven Geotextile.

**Insert:**

- 2.1.1.2 All excavation areas below water level to 0.1 m above water level at the time of construction: Facing Stone in accordance with Section 31 05 16 – Aggregates, wrapped with Nonwoven Geotextile.

**Delete:**

- 3.5.4 Backfill of all excavation areas below water level to 0.1 m above water level (at the time of construction) with Gabion Mat Rock Fill material wrapped with Nonwoven Geotextile.

**Insert**

- 3.5.4 Backfill of all excavation areas below water level to 0.1 m above water level (at the time of construction) with Facing Stone material wrapped with Nonwoven Geotextile.

3. Contract Drawings

**Delete:**

Dimension “4.0 MIN TEMPORARY TRAFFIC LANE (ONE WAY)” on Drawing C202, Section C

**Insert:**

Dimension “5.0 MIN TEMPORARY TRAFFIC LANE (ONE WAY)” on Drawing C202, Section C

**Attachments**

PWGSC Environmental Effects Evaluation (EEE)  
Photos from Wood Creek Quarry

**All other terms and conditions remain unchanged.**



Figure 1: Entrance to Wood Creek Quarry



Figure 2: Stock Pile Adjacent to Wood Creek Quarry



**Environmental Effects Evaluation (EEE) Report**

**Section 67**

**Canadian Environmental Assessment Act (CEAA) 2012**

**For**

**Muncho Lake Roadside Stabilization Project**  
**Muncho Lake, BC**

**PWGSC Project No. R.017173.030**

*Prepared by*  
*Public Works and Government Services Canada*  
*Environmental Services, Edmonton, Alberta*

*May 2014*

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***PART A: PROJECT INFORMATION***

**Project Title:** Muncho Lake Roadside Stabilization Project  
**Location:** Muncho Lake  
**Lat / Long:** 3 sites

**Federal Authority:** Public Works and Government Services Canada  
**Contact person:** Laurie Crawford  
**Telephone:** (780) 497-3892

**EEE Assessor:** Laurie Crawford  
**Telephone:** (780) 497-3892

**PWGSC Project Number:** R.017173.030

***PART B: SCOPE OF PROJECT***

**Project Description**

PWGSC – Environmental Services was retained by PWGSC – Alaska Highway Program to prepare an Environmental Effects Evaluation (EEE) under the Canadian Environmental Assessment Act (CEAA 2012) for three separate areas of repair work to the shoreline embankment along Muncho lake of the Alaska Highway Corridor in northern British Columbia. All three areas are located within 1.5 KM of each other, on the east shore of Muncho Lake. The Alaska Highway at these locations is at an elevation of approximately 802 m and is 1.7 to 3 m above the lake level (April 23-25, 2013 data).<sup>1</sup> A bedrock ridge to the east of the highway extends up to an elevation of approximately 1050 m. The project consists of widening the Alaska Highway along 3 areas adjacent to Muncho Lake where the left shoulder is considered to be of substandard width and has the potential to generate a health and safety risk for vehicular traffic.

Major activities for this work include:

- Traffic control for the duration of construction works including the installation and removal of temporary concrete barriers, privacy fence, signage, flagging, and gravel shouldering.
- Excavation and offsite disposal of existing BST and existing highway embankment/road gravels to facilitate construction of the retaining walls and gabion baskets.
- Removal, transport offsite, and stockpiling of existing rip rap not suitable for re-use within the limits of the work.
- Removal and disposal of existing gabions within the limits of the proposed retaining wall and gabion mats. Temporary stockpiling of the existing gabion fill materials (for later re-use).
- Installation of a wire-mesh faced mechanically stabilized earth (MSE) wall.
- Installation of gabion mats.
- Transport, placement, compaction, and grading of granular base course in preparation for the reinstatement of BST.
- BST reinstatement at a later date on a separate contract.

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<sup>1</sup> EBA – Geotechnical Site Investigation Data Report – Roadside Stabilization of Three Locations on the Alaska Highway Adjacent to Muncho Lake, BC – June 2014



## **Scheduling**

The anticipated schedule for the proposed work is September 1, 2014, with completion of works October 31, 2014. Further scheduling considerations are dependent upon recommendations from BC Ministry of Environment.

## **Regulatory**

### **Federal**

#### ***Canadian Environmental Assessment Act, 2012***

On July 6, 2012 a new *Canadian Environmental Assessment Act, 2012* (CEAA, 2012) came into force. Projects that may require an environmental assessment (EA) are set out in the *Regulations Designating Physical Activities*. For projects on federal lands that are not on the *Regulations Designating Physical Activities*, Section 67 of CEAA 2012 applies. Section 67 states that federal authorities must ensure that projects on federal lands will not likely cause significant adverse environmental effects. CEAA 2012 also sets out requirements for annual reporting to Parliament regarding this obligation.

In response to the legislative changes, Public Works and Government Services Canada (PWGSC) developed a CEAA 2012 framework that details the procedure to ensure that projects are assessed for potential adverse environmental effects. The procedure includes a checklist that incorporates a determination of the risk for adverse environmental effects into the departmental Environmental Compliance Management Program (ECMP). The ECMP allows for the comprehensive and effective management of environmental compliance related to project management. The level of risk determined is based on the size and type of the project, level of effort required, as well as the potential for impacts to components of the environment as described in Section 5 of the Act.

Under Section 5 of the Act, the environmental effects that are to be taken into account in relation to an act or thing, a physical activity, a designated project or a project are

- (a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:
  - i. fish as defined in section 2 of the Fisheries Act and fish habitat as defined in subsection 34(1) of that Act,
  - ii. aquatic species as defined in subsection 2(1) of the Species at Risk Act,
  - iii. migratory birds as defined in subsection 2(1) of the Migratory Birds Convention Act, 1994 and
  - iv. any other component of the environment that is set out in Schedule 2.

Other effects to the environment or with respect to aboriginal peoples are outlined under Section 5(1)(c) of the Act.

Under Section 5(2), if the carrying out of the physical activity, the designated project, or the project requires a federal authority to exercise a power or perform a duty or function conferred on it under any Act of Parliament other than this Act, the following environmental effects are also to be taken into account.

- (a) A change, other than those referred to in paragraphs (1)(a) and (b), that may be caused to the environment and that is directly linked or necessarily incidental to a federal authority's exercise of a



## **Environmental Effects Evaluation (EEE) Report – Muncho Lake Roadside Stabilization**

power or performance of a duty that would permit the carrying out, in whole or in part, of the physical activity the designated project or the project, and

- (b) An effect, other than those referred to in paragraph (1)(c), of any change referred to in paragraph (a) on
- i. Health and socio-economic conditions,
  - ii. Physical and cultural heritage;
  - iii. Any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

### ***Fisheries Act***

The *Fisheries Act* was amended on June 29, 2012. As of November 25, 2013 the new fisheries protection provisions of the Act will come into force. The Fisheries Protection Policy describes the changes to the *Fisheries Act* made in 2012. The focus is now on the productivity of commercial, recreational and Aboriginal fisheries; the institution of enhanced compliance and protection tools that facilitate enforcement; provide clarity, certainty and consistency of regulatory requirements; and enable enhanced partnerships with other agencies of government and local groups to ensure a comprehensive approach to fisheries protection. The changes include a prohibition against causing serious harm to fish that are part of or support a commercial, recreational or Aboriginal fishery (Sec. 35), provisions for flow and passage (Sec. 20 and 21), and a framework for regulatory decision-making (Sec. 6 and 6.1). These provisions are intended to reduce threats to habitat (degradation or loss), flow alteration, aquatic invasive species, overexploitation of fish, and pollution of many kinds that may adversely affect water quality and fish health.

Proponents of development activities taking place in or near water must

- Understand the types of impacts projects are likely to cause;
- Take measures to avoid and mitigate impacts to the extent possible;
- Request authorization from the Minister and abide by the conditions of any such authorization, when it is not possible to avoid and mitigate impacts of projects that are likely to cause serious harm to fish; and,
- Ensure that projects conform to all other statutory requirements.

Fish that are **part of** commercial, recreational or Aboriginal fisheries are interpreted to be those fish that fall within the scope of applicable federal or provincial fisheries regulations, as well as those that can be fished by Aboriginal organizations or their members for food, social or ceremonial purposes or for purposes set out in a land claims agreement. Fish that **support** these fisheries are those fish that contribute to the productivity of a fishery (often, but not exclusively, as prey species).

Serious harm to fish is defined under the Act as “the death of fish or any permanent alteration to, or destruction of, fish habitat. Further interpretation of serious harm to fish and principles for meeting the goals and objectives of the Fisheries Protection Policy Statement are provided in the Policy.

Most water bodies contain fish, or their habitat, that would be subject to the prohibition against serious harm to fish. These include all three of Canada’s oceans; areas of fishing for food, social, or ceremonial purposes or under land claims agreements by Aboriginal peoples; and areas covered by federal or provincial fisheries regulations. Note that some water bodies may be specifically excluded from the application of federal or provincial regulations.

## **Environmental Effects Evaluation (EEE) Report – Muncho Lake Roadside Stabilization**

When proponents are unable to completely avoid or mitigate serious harm to fish, the project will require authorization under Subsection 35(2) of the *Fisheries Act* in order for the project to proceed without contravening the Act.

The Policy indicates that some water bodies may not contain fish or provide fish habitat that are part of or support commercial, recreational or Aboriginal fisheries, and therefore may not be subject to the prohibition. These need to be determined on a case-by-case basis. Proponents are advised to use appropriate and recognized scientific methods to consider whether any such water bodies would be affected by their projects.

Provisions for flow and fish passage are outlined in Sections 20 and 21 of the Act. The provisions include the following:

- Allow the Minister to request studies and evaluations related to obstructions or other things that may be hindering fish passage or harming fish;
- Allow the Minister to request: the removal of or modifications to obstructions or things that are harmful to fish or impede flow or fish passage; the installation of fish-ways, screens and guards; or that sufficient water flow be provided for fish passage; or
- Prohibit the damage or removal of fish-guards, fish-ways, and screens.

Projects that have the potential to obstruct fish passage, modify flow, or result in the entrainment of fish, and which may cause serious harm to fish, may require an authorization under Subsection 35(2). The conditions of authorizations may include avoidance, mitigation and offsetting measures to provide fish passage around obstructions. The conditions may also require water flows necessary to permit the free passage of fish, and the need for fish-guards or screens over water intakes.

There are four factors outlined in Section 6 of the *Fisheries Act* that the Minister must consider before exercising a Ministerial power such as the issuance of a Subsection 35(2) authorization or a request to provide for fish passage or sufficient flow:

- The contribution of the relevant fish to the ongoing productivity of commercial, recreational or Aboriginal fisheries;
- Fisheries management objectives;
- Whether there are measures and standards to avoid, mitigate or offset serious harm to fish that are part of the named fisheries, or that support such a fishery; and
- The public interest.

The components of each consideration are provided in more detail in the Fisheries Protection Policy.

General advice on understanding when a regulatory review or *Fisheries Act* authorization is required is provided in Box 1 and in steps 1 to 3 of Figure 2 of the Fisheries Protection Policy. The Policy also outlines additional powers of the Minister (Sec. 37) and a duty to notify (Sec. 38) that imposes a series of obligations upon persons responsible for projects that lead to occurrences that result in serious harm to fish that are part of or support the designated fisheries. An inspector or fishery officer has the authority to order the immediate action necessary to correct the situation at the expense of the person(s) identified as responsible.

In addition consequences for non-compliance with the prohibition against serious harm to fish or non-compliance with the conditions of an authorization include minimum and maximum penalties, depending on the type of offence, and whether it is a first or subsequent offence.

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*Operational Guidance* - In preparation for coming into force of the new fisheries protection provision, on-line guidance is being developed for external stakeholders. This guidance will allow proponents, consultants and partners to identify when projects require Departmental review.

Guidance is being developed to identify water body types that are unlikely to support fish and fish habitat that are part of, or support a commercial, recreational or Aboriginal fishery. Projects occurring within these water body types are therefore unlikely to cause impacts to the ongoing productivity of fisheries, and would not receive project-specific review by the Department. Examples of these marginal water bodies may include, but are not limited to:

- non-fish bearing-waters
- watercourses not providing migratory corridors or in-stream habitat
- artificial irrigation, water supply, water management, or industrial waterbodies not connected to aquatic systems that support fish

Guidance is also being developed to identify specific species and areas that are at greater risk of impact to the ongoing productivity of fisheries. Site-specific review by the Department of projects affecting these species and/or habitats types should be conducted regardless of work, undertaking or activity proposed. These sensitive species and habitats may include, but are not limited to:

- designated species at risk and their residences or critical habitat
- defined limiting or rare habitats (including spawning, rearing, nursery, feeding and migratory routes), for instance areas that have been identified as important in support of local fisheries management objectives

*The Minor Impacts List* – The list of minor impacts to fish and fish habitat will identify impact types, and by extension project types, that are unlikely to result in effects to the ongoing productivity of commercial, recreational and Aboriginal fisheries. Due to the low-risk nature of these impacts, the Department of Fisheries and Oceans (DFO) will not provide a site-specific review of these projects, and proponents will be responsible for implementing existing best practices to maintain compliance with the *Fisheries Act*. Minor impacts may include, but are not limited to:

- watercourse alterations, such as channel realignment or vegetation removal, that are temporary or can be done in the dry
- temporary obstructions that take place outside critical migratory, spawning and nursery periods for local fish species
- spatial impacts, such as infilling, dredging or excavation activities, that occur within the existing footprint of previous works or that are of a footprint small enough that local effects on fisheries productivity would not likely occur

Compliance monitoring will be carried out primarily on projects which the Department reviews, provides advice, authorizes, or issues requests or orders, to determine if *Fisheries Act* requirements are being complied with.

Partnerships will be developed and will include regulatory arrangements with other federal agencies, and provincial regulators to allow for administration of the applicable fisheries protection provisions of the *Fisheries Act* by the organizations best positioned to do so. Existing regulatory partnership arrangements will continue to be supported by DFO.

Under the *Fisheries Act* the following definitions are provided:

“fish” includes

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- a) parts of fish,
- b) shellfish, crustaceans, marine animals and any parts of shellfish, crustaceans or marine animals, and
- c) the eggs, sperm, spawn, larvae, spat and juvenile stages of fish, shellfish, crustaceans and marine animals;

"fish habitat" means spawning grounds and any other areas, including nursery, rearing, food supply and migration areas, on which fish depend directly or indirectly in order to carry out their life processes;

"fishery" includes the area, locality, place or station in or on which a pound, seine, net, weir or other fishing appliance is used, set, placed or located, and the area, tract or stretch of water in or from which fish may be taken by the said pound, seine, net, weir or other fishing appliance, and also the pound, seine, net, weir or other fishing appliance used in connection therewith.

**This work falls under a DFO self assessment review *Measures to Avoid Harm* (formerly known as Notification to DFO). The project will not cause adverse effects to the fish and fish habitat of the area under the new regime. In this case, DFO will not be contacted for review.**

### ***Navigation Protection Act***

The new *Navigation Protection Act* (NPA) has replaced the *Navigable Waters Protection Act* (NWPA).

The new NPA lists the waterways where approval is required prior to the building of works that substantially interfere with navigation. Works in waterways not listed in the Act will be subject to the common law public right of navigation.

**This project does not fall under the NPA list of waterways where approval is required.**

### ***Species at Risk Act***

Promulgated in 2003 the purpose of the *Species at Risk Act* (SARA) is to prevent wildlife species from being extirpated or becoming extinct, to provide for wildlife recovery, and to manage species of special concern. In addition, SARA has certain implications for environmental assessment under CEAA. Specifically, under Section 79, every person who is required to ensure that an assessment of the environmental effects of a project is conducted, and every authority who makes a determination under paragraph 67(a) or (b) of the CEAA, 2012 in relation to a project, must without delay, notify the competent minister or ministers in writing of the project if it is likely to affect a listed wildlife species or its critical habitat. The person must identify the adverse effects of the project on the listed wildlife species and its critical habitat and, if the project is carried out, must ensure that measures are taken to avoid or lessen those effects and to monitor them. The measures must be taken in a way that is consistent with any applicable recovery strategy and action plans.

The SARA applies to federal lands, the internal waters of Canada and the territorial sea of Canada. The SARA recognizes that Canada's protected areas, especially national parks, are vital to the protection and recovery of species at risk.

Under SARA the following definitions are provided:

"aquatic species" means a wildlife species that is a fish, as defined in section 2 of the *Fisheries Act*. Refer to the definition of "fish" under *Fisheries Act* above.

"habitat" is defined as:

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- (a) In respect of aquatic species, spawning grounds and nursery, rearing, food supply, migration and any other areas on which aquatic species depend directly or indirectly in order to carry out their life processes, or areas where aquatic species formerly occurred and have the potential to be reintroduced;
- (b) in respect of other wildlife species, the area or type of site where an individual or wildlife species naturally occurs or depends on directly or indirectly in order to carry out its life processes or formerly occurred and has the potential to be reintroduced.

“critical habitat” is defined as the habitat that is necessary for the survival or recovery of listed wildlife species and that is identified as the species’ critical habitat in the recovery strategy or in an action plan for the species.

“project” is defined as:

- a designated project as defined in subsection 2(1) of the *Canadian Environmental Assessment Act, 2012* or a project as defined in section 66 of that Act;
- a project as defined in subsection 2(1) of the [\*Yukon Environmental and Socio-economic Assessment Act\*](#); or
- a development as defined in subsection 111(1) of the [\*Mackenzie Valley Resource Management Act\*](#).

"wildlife species" means a species, subspecies, variety or geographically or genetically distinct population of animal, plant or other organism, other than a bacterium or virus, that is wild by nature and

- (a) is native to Canada; or
- (b) has extended its range into Canada without human intervention and has been present in Canada for at least 50 years.

The following prohibitions are applicable to species listed on Schedule 1 of the Act:

Section 32(1): No person shall kill, harm, harass, capture or take an individual of a wildlife species that is listed as an extirpated species, an endangered species or a threatened species;

Section 33: No person shall damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered species or a threatened species; and

Section 58(1): No person shall destroy any part of the critical habitat of any listed endangered species or of any listed threatened species.

Section 73 and 74 of SARA state that a competent minister may enter into an agreement or issue a permit authorizing the person to engage in an activity affecting a listed wildlife species, its critical habitat or the residences of its individuals provided certain conditions are met.

**This project is not expected to cause any disruption to any Species At Risk.**

### **Provincial**

#### ***British Columbia Environmental Assessment Act (BCEAA):***

During the environmental assessment conducted in 2010 the Environmental Assessment Office (EAO) of the Province of British Columbia was contacted with a request for a determination of whether or not the project triggers the (BCEAA). The EAO responded that a BCEA was not triggered by this project because the requirement for an assessment under BCEAA with respect to highway improvements is quite specific, in that,

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unless the project involves the addition of more than two (2) lanes of paved public highway over a continuous distance of more than 20 km, a screening assessment under BCEAA is not required (Reviewable Projects Regulation (B.C. Reg. 370/2002)).

**The works proposed for the three sections of the highway will not involve the addition of more than two lanes of paved highway, therefore no EAO is required to screen the project under BCEAA.**

### ***Water Act Water Regulation (BC/Reg. 204/88).***

Management of inland fisheries has largely been delegated to the provinces and the Yukon Territory although the administration of the fisheries protection provision remains with the federal government. However, provincial authorities deliver a range of natural resource conservation initiatives under various provincial statutes that complement those of the federal government. Arrangements between DFO and other federal, provincial and territorial authorities provide the mechanisms to collaborate on managing threats to fisheries (Fisheries Protection Policy Statement, DFO, 2013).

The BC Water Act is the main provincial statute regulating water resources in British Columbia. Under the Act, it is an offence to divert or use water, or alter a stream, without formal approval from the Province.

Section 9 regulates changes in or about a stream and is set out to ensure that water quality, riparian habitat, and the rights of licensed water users are not compromised.

Part 7 of the Water Act Regulation permit the use of notifications rather than approvals for certain types of works; contain provisions for the protection of water quality, habitat, and other water users; and authorize changes to streams. Changes in and about a stream must be compliant with the requirement of the Water Act, and authorized by an approval licence, or order under Section 9 of the Water Act, or authorized through a Notification to the Ministry of Water, Land and Air Protection (WLAP) as permitted by Part 7 of the Regulation. Replacement and maintenance of culverts and outfalls, and temporary stream diversions around a worksite are activities that are allowed under the Notification process if they adhere to general standards and best practices. A Notification must be submitted to WLAP at least 45 days prior to modification or installation of a stream culvert for the purpose of a road, trail, or footpath.

The specific standards associated with permitting this type of work are described in Subsection 44(1)(a) of the provincial *Water Act Water Regulation*. Specifically, installation, maintenance or removal of a stream culvert for crossing a stream for the purposes of a road or trail stream crossing is permitted, provided that:

- equipment used for site preparation, construction, maintenance, or removal of the culvert is situated in a dry stream channel or operated from the top of the bank;
- in fish bearing waters, the culvert allows fish in the stream to pass up or down stream under all flow conditions;
- the culvert inlet and outlet incorporate measures to protect the structure and the stream channel against erosion and scour;
- if debris cannot safely pass, provision is made to prevent the entrance of debris into the culvert;
- the installation, maintenance, or removal does not destabilize the stream channel;
- the culvert and its approach roads do not produce a backwater effect or increase the head of the stream;
- the culvert capacity is equivalent to the hydraulic capacity of the stream channel or is capable of passing the 1 in 200 year maximum daily flow without the water level at the culvert inlet exceeding the top of the culvert;
- the culvert has a minimum equivalent diameter of 600 mm;



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- a culvert having an equivalent diameter of 2 m or greater, or having a design capacity to pass a flow of more than 6 cubic metres a second, is designed by a professional engineer and constructed in conformance with that design;
- the culvert is installed in a manner which will permit the removal of obstacles and debris within the culvert and at the culvert ends;
- the stream channel, located outside the cleared width, is not altered;
- embankment fill materials do not and will not encroach on culvert inlets and outlets;
- the culvert has a depth of fill cover which is at least 300 mm or as required by the culvert manufacturer's specifications;
- the maximum fill heights above the top of the culvert do not exceed 2 m; and
- the culvert material meets the standards of the Canadian Standards Association.

Additionally, according to Section 3.2 of *A User's Guide to Working In and Around Water: Understanding the Regulation Under British Columbia's Water Act*, "In general, works that do not involve any diversion of water, that may be completed within a short period of time and that have little impact on the environment may be conducted in compliance with the Regulation under the *Water Act* through the notification process. Such works require notification to and review by the Ministry of Environment's Environmental Stewardship Division." One of the seven categories listed under these provisions addresses stream crossings, including the installation, maintenance or removal of stream culverts for the purpose of a road, trail or footpath. Three culvert upgrade/replacements included in the proposed project fall under this category, therefore notification of such will be forwarded to the Ecosystem Section Head of the Environmental Stewardship Division office in Fort St. John.

### ***BC Standards and Best Practices for Instream Works:***

This document is a comprehensive description of the standards and best practices for the planning, design and construction of instream projects in accordance with the *BC Water Act*. Any proposed works in or about a stream must protect fish and wildlife habitat. Habitat includes the watercourse itself as well as the vegetated streamside areas that provide nutrients and shade to the stream. Fish habitat includes watercourses, streams, ditches, ponds and wetlands that provide water, food, or nutrients into a fish-bearing stream even if they do not contain fish, or if they only have temporary or seasonal flows.

Works in or about a stream requiring a Notification to the Province may include stream crossings, stream channel maintenance, stream bank and lakeshore stabilization, habitat enhancement and restoration, beaver and beaver dam management, miscellaneous works, and emergency works. Types of instream work that require an approval application under the *Water Act* include:

- Culvert installation for reasons other than those listed under the "stream crossings" section
- Watercourse or channel realignment
- Retaining wall or bank protection installation
- Dam construction
- Dredging
- Weir construction
- Construction of a sediment sump
- Pond or lake creation
- Permanent flow diversions, and
- Other permanent work.

The link to this comprehensive document is

<http://www.env.gov.bc.ca/wld/documents/bmp/iswstdsbpsmarch2004.pdf>.

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This work is within 30m of water as such, must be compliant with applicable provincial, federal and/or municipal legislation/regulations including the *BC Water Act*, the *BC Fish Protection Act*, and the federal *Fisheries Act*. It is also expected that these works must be consistent with the *Standards and Best Practices for Instream Works* and the *Peace Region Terms and Conditions*.

This work may also require limited removal of shoreline vegetation and so is subject to the *Ministry of Forest and Range (MFR) Riparian Management Area Guidebook*. When removing this vegetation it is important to note that *Section 34* of the *BC Wildlife Act* prohibits damage to any active bird nest and nests of raptors regardless of occupation.

The *Peace Region Least Risk Timing Windows - Biological Rationale* is a document that indicates the potential impacts of disturbance on a wide range of species. Least-risk windows divide a calendar year into critical, cautionary, and low risk windows based on the ecology of specific species groups. Critical and cautionary timing windows cover the time when a species is most susceptible to disturbance, and development should be avoided. Low risk timing windows are defined when species are least susceptible to disturbance; development activities should be planned for low risk windows whenever possible. Critical timing windows cover breeding and rearing seasons for birds, and late winter, parturition, and early rearing for ungulates. Cautionary windows cover late rearing for some sensitive birds (sandhill cranes, trumpeter swans, and raptors) and the early winter rut period for caribou, mountain sheep, and mountain goats.

### ***PART C: SCOPE OF EVALUATION***

#### **Environmental Setting**

Muncho Lake is a moderate sized lake located in Muncho Lake Provincial Park in northern British Columbia and is considered the largest freshwater lake in the Northern Rockies. The lake is situated in the Spruce-willow-birch moist and cool (SWBmk) biogeoclimatic zone, a sub-alpine area at an elevation of 817 m. The lake is approximately 12 km long and ranges in width from 1-1.8 km. It has a surface area of 145 ha, an average depth of 52 m and a maximum depth of 110 m based on a bathymetric survey by BC's Fish and Wildlife Branch in 1972. Muncho Lake flows into the Trout River, a tributary to the Liard River. Muncho Creek flows into the lake from the south. There are two provincial campgrounds and a lodge on Muncho Lake with recreational fishing and boating being popular activities on the lake.<sup>2</sup>

#### **Physical Environment**

##### ***Physiography and Surficial Geology***

Soils at these three locations consist of highway roadfill materials that were used during the original construction of the highway and any rehabilitation works thereafter. Regional native soils include Gray Luvisols and Dystric Brunisols with Gleysols developed on loam to clay loam textured glacial till and lacustrine. Organic Cryosolic soils are common on peat plateau bogs, palsa bogs and some veneer bogs, and 25–50% of the ecoregion is wetland. There is extensive discontinuous permafrost with low to medium ice content, which takes on a sporadic discontinuous pattern in the very north of the ecoregion.

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<sup>2</sup> AECOM – Muncho Lake Fish and Fish Habitat Assessment – March 2013



## ***Hydrology***

Muncho Creek empties into the Trout River within approximately 200 m of the southwest corner of the Muncho Lake Maintenance Camp site. From there, Trout River meanders in a generally northerly direction, parallel to the west border of the site, and empties into Muncho Lake. Both Trout River and Muncho Lake are fish bearing water bodies. Muncho Creek is not a fish bearing water body (conversation with Peter Goetz of the BC Ministry of Water Land and Air Protection in 2003).

## ***Climate***

This ecoregion, the Muskwa Plateau Ecoregion of the Taiga Plain Ecozone, occurs along the foothills of the Rocky Mountains in northeastern British Columbia, spanning the border with the Northwest Territories. Climate is marked by long cold winters and short cool summers. Mean annual temperature for the region surrounding the Muncho Lake is approximately -1°C. Mean summer temperature is 12°C and mean winter temperature is -13°C. Mean annual precipitation ranges 400–500 mm in the lower elevations and up to 800 mm at the higher surrounding plateaus and passes.

## **Biological Environment**

### ***Wildlife and Vegetation***

The Muncho Lake provincial park supports both sub-alpine and alpine species. Moose, elk, Stones mountain sheep, caribou, mountain goat, grizzly bear, black bear and wolf are represented. Wolverine and lynx are also represented in this region. Regional forests are characterized mainly by their elevation. Dwarf willows, birch, alpine grasses and alpine fir are found at the higher elevations when soils are present. White spruce, black spruce and lodgepole pine dominate the lower, warmer elevations. Poorly drained sites support black spruce and some white spruce.

### ***Aquatic Resources***

AECOM completed a fish habitat report for PWGSC on the near shore areas between KM 699.9 and 707.6. This report was produced to determine fish and fish habitat along the area of potential concern for highway embankment erosion.

### ***Riparian Habitat***

Near-shore vegetation was dominated by shrubby willow (*salix* spp.) and small trembling aspen (*populus tremuloides*) trees. Occasional spruce trees, forbs and graminoid species were also observed. In most areas, vegetation was sparse within 20 m of the shoreline. Large boulder rip rap, the Alaska Highway and steep cliff sides prevent the establishment of most vegetative species. With the exception of two alluvial fans, near shore vegetation cover was approximately 5%.

Trees and shrubs close to the shoreline of Muncho Lake were consistently small and stunted. These plants would not provide any direct habitat values for fish, but would provide nutrients in the form of fallen leaves every autumn. Ungulate browsing on young shoots and vegetation over 1 m in height provides evidence that there is some wildlife value in the near-shore vegetation community.

Within the alluvial fans, vegetation was more abundant within 20 m of the shore. Species composition was similar to other areas, but overall vegetation density increased to about 40%. Sparse conifers were the dominant

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vegetation type within these fans. Ground cover included the above species in addition to several low growing woody shrubs.

The Alaska Highway and steep cliff sides create a distinct difference between riparian and upland vegetation communities. Pine and spruce trees dominated the upland vegetation, and an understory of woody shrubs and lichens.

Low to minimal shoreline terrestrial vegetation was present and pockets of aquatic vegetation were noted occurring in near shore areas in areas dominated by fens. Minimal shading from the vegetation to the foreshore was present from the sparse and stunted vegetation. Some nutrient values from leaf litter and aquatic detritus will be provided to the lake and tributary streams from the surrounding terrestrial vegetation. Aquatic vegetation was low growing and blanketed areas which would provide minimal fish habitat value.

### ***Substrate and Habitat Quality***

The study area completed for the fish habitat report indicated that habitat units remained contiguous throughout. Areas of similar grain size were large and homogenous; transition zones were easily observed. Aquatic vegetation was limited to areas immediately south of historical alluvial fans, and was associated with fine-textured substrates. Boulders were loosely associated with gabion baskets and small bays. Gravel with some cobble was the most common substrate observed near shore and accounted for almost half of the study area. A band of clean substrate was observed along the entire lake margin, while littoral areas below wind and wave scour showed some signs of sediment deposition. Potential high quality spawning areas account for less than 15% of the study area.

The Ministry of Forest, Lands and Natural Resource Operations, of the British Columbia Provincial Government, was contacted in 2003 for a previous assessment of the area, in regards to local fisheries resources in the vicinity of Muncho Lake. Muncho Lake and Trout River comprise important habitat for Bull Trout (*Salvelinus confluentus*), which is a provincially listed species of special concern. Blue-listed species, such as the Bull Trout, include any indigenous species or subspecies considered to be of Special Concern (formerly Vulnerable) in British Columbia. Taxa of Special Concern have characteristics that make them particularly sensitive or vulnerable to human activities or natural events. (Endangered Species and Ecosystems in British Columbia) Muncho Lake is also home to Lake Trout, Arctic Grayling, Mountain Whitefish, White Sucker and Longnose Sucker populations. Muncho Lake represents a local attraction that is utilized by both locals and tourists.

Muncho Creek, a small stream emptying into the Trout River adjacent to the southwest corner of the site, is not a fish-bearing watercourse and runs underground for much of its length along the valley.<sup>3</sup>

### **Socio-economic Environment**

Muncho Lake is located within the Muskwa/Kechika Management Area (M-KMA). The M-KMA was enacted through the M-KMA act and M-KMA Management Plan that was adopted through Order-in Council to provide guidance to managers in government agencies and non-governmental organizations, communities and industry groups while conducting activities in the area. Muncho Lake is designated as a Class A Provincial Park which allows a range of commercial and non-commercial recreational activities in parks, with exception to mining, oil and gas, forest harvest and hydro-electric development activities. Areas outside the park are either classified as a special management zone or enhanced resource management zone. The enhanced resource management zone is located along the Alaska highway corridor and emphasis is on managing the highway corridor to enhance the recreation and tourism resources. The intent of the management zone is to provide for intensive resource development and includes objectives for protection of cultural, habitat and trapping values.

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<sup>3</sup> AECOM – Muncho Lake Fish and Fish Habitat Assessment – March 2013

**Scoping**

This environmental effects evaluation, as defined in the appendix, considers the full range of project / environment interactions and the environmental factors that could be affected by the project as defined above and the significance of related effects after mitigation.

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**Table 1:** Potential Project / Environment Interactions Matrix

P = Potential Effect of Project on Environment; ? = Not enough Information; ' - ' = No Interaction

<b>Project Phase / Physical Work/Activity</b>	<b>Soil (Surface and Subsurface) Quality</b>	<b>Groundwater Quality/Quantity</b>	<b>Rivers / Lakes / Streams (and Associated Drainage) Quality/Quantity</b>	<b>Marine/Estuary/Saltmarsh Water Quality</b>	<b>Wetlands (Bogs, Fens, Swamps)</b>	<b>Fish / Fish Habitat</b>	<b>Birds / Bird Habitat</b>	<b>Terrestrial Species</b>	<b>Aquatic Species</b>	<b>Agriculture / Aquaculture</b>	<b>Aboriginal Interests</b>	<b>Archaeology / Paleontology / Heritage</b>	<b>Socio-economic Environment</b>	<b>Land Use</b>	<b>Air Quality / Noise</b>	<b>Health/Safety</b>
<b>Construction</b>																
Soils Excavation	-	-	P	-	-	P	-	P	-	-	-	-	-	-	-	P
Placement of Gabion Baskets	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P
Placement of Engineered Earth	-	-	-	-	-	P	-	P	-	-	-	-	-	-	-	P
BST	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	P
<b>Operation / Maintenance</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Decommissioning / Abandonment</b>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

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**Table 2:** Potential Project / Valued Ecosystem Interactions and Mitigation Measures (S.2(1))

<b>Table 2.1 Valued Ecosystem Component – Lake Quality</b>				
<b>Potential Effect: Possible sedimentation into lake</b>				
<b>Potential Interaction</b>		<b>Mitigation</b>		
During soils removal activities there is a possibility of soil particles entering the water column.		Ensure that all works near water have proper siltation and erosion control.		
Contamination of surface water from temporarily stored material during soil removal activities.		<p>Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures are to be used as appropriate to prevent erosion and release of sediments and/or sediment laden water during the construction phase. These structures are to be left in place until vegetation is re-established and/or all exposed soils are stabilized.</p> <p>The exposed soil area must be minimized by limiting the area that is exposed at one time and by limiting the time that any one area is exposed. All stockpiled soil must be covered and/or dyked to prevent erosion and release of sediment laden water. Wherever possible, exposed soil is to be replanted or sodded to ensure soil stabilization.</p> <p>Follow the BC MOE document “Standards and Best Practices for Instream Works” to ensure compliance with the provincial ministry.</p> <p>Ensure the BC MOE Notification for works is available on site and ensure compliance with all the terms and conditions of this document.</p>		
<b>Magnitude</b>	<b>Reversibility</b>	<b>Geographic Extent</b>	<b>Duration</b>	<b>Frequency</b>
<b>Small</b>	<b>Reversible</b>	<b>Immediate</b>	<b>Short-term</b>	<b>Intermittent - for the duration of soil removal</b>
<b>Residual Effects:</b>				
<b>Insignificant</b>				
<b>Monitoring:</b>				
<b>An onsite environmental monitor will be monitoring the potential for siltation of Muncho Lake</b>				
<b>Comments:</b>				
Construction activities could result in the mobilization of on-site soils, especially during precipitation events. Such runoff events are likely to be of short duration and confined to the project site. The implementation of effective mitigation measures can reduce such effects to insignificant levels.				

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Table 2.2 Valued Ecosystem Component – Fish/Fish Habitat				
Potential Effect: From soils removal and gabion basket reconstruction				
Potential Interaction	Mitigation			
<p>There may be the potential for soil particles to enter the water column through the removal of soils and the reconstruction of the gabion baskets. Work is to be conducted out of the wetted perimeter of the lake however, the reconstruction activities are taking place directly adjacent to the shoreline.</p> <p>Contamination of surface water can occur from temporarily stored materials.</p>	<p>Ensure there are appropriate spill kits on all equipment and available to the operators at all times.</p> <p>All waste materials must be disposed of in a provincially approved manner so as to mitigate potential effects generated by leachate entering the adjacent waters.</p> <p>If any construction debris/material (eg plastic, food scraps ect.) enter the aquatic environment they must be removed immediately and disposed of in a provincially approved manner.</p> <p>Ensure that all works near water have proper siltation and erosion control.</p> <p>Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures are to be used as appropriate to prevent erosion and release of sediments and/or sediment laden water during the construction phase. These structures are to be left in place until vegetation is re-established and/or all exposed soils are stabilized.</p> <p>The exposed soil area must be minimized by limiting the area that is exposed at one time and by limiting the time that any one area is exposed. All stockpiled soil must be covered and/or dyked to prevent erosion and release of sediment laden water. Wherever possible, exposed soil is to be replanted or sodded to ensure soil stabilization.</p> <p>Follow the BC MOE document “Standards and Best Practices for Instream Works” to ensure compliance with the provincial ministry regulations and guidelines.</p> <p>Ensure the BC MOE Notification for works is available on site and ensure compliance with all the terms and conditions of this document.</p>			
	Magnitude	Reversibility	Geographic Extent	Frequency
	Small	Reversible	Immediate	Intermittent – during soils removal and gabion placement
	Residual Effects:			
	Insignificant			
Monitoring:	An onsite environmental monitor will be monitoring the potential for siltation of Muncho Lake			
Comments:	Construction activities could result in the mobilization of on-site soils, especially during precipitation events. Such runoff events are likely to be of short duration and confined to the project site. The implementation of effective mitigation measures can reduce such effects to insignificant levels.			

**Environmental Effects Evaluation (EEE) Report – Muncho Lake Roadside Stabilization**

Table 2.3 Valued Ecosystem Component – Terrestrial Species					
Potential Effect: Ungulate Disturbance					
Potential Interaction		Mitigation			
Project activities may result in disturbance to wildlife.		Onsite personnel must ensure food scraps and garbage are not left at the project site.			
Impacts on wildlife due to vegetation clearing		Disturbance to wildlife in and near the project area should be avoided where possible.			
		The contractor must prevent hydrocarbon product releases in and around the project area.			
Magnitude	Reversibility	Geographic Extent	Duration	Frequency	
Small	Reversible	Immediate	Short-term	Once	
Residual Effects:		Insignificant			
Monitoring:		None required			
Comments:					
The potential exists for the disturbance of wildlife due to an increase in noise and dust around the project site. Such effects are likely to be of short duration and confined to the project site and can be avoided through the application of effective mitigation measures.					

**Environmental Effects Evaluation (EEE) Report – Muncho Lake Roadside Stabilization**

Table 2.4 Valued Ecosystem Component – Health and Socio Economic					
Potential Effect: Disturbance to community					
Potential Interaction		Mitigation			
Persons present on or surrounding project site may be exposed to hazards.		Workers who come in contact with hazards must be provided with and use appropriate personal protective equipment.			
Operation of the site may cause exposure to hazardous materials.		Site access must be restricted to authorized personnel only.			
There may be some disturbance to recreational fishing.		Dust suppression measures must be applied to prevent fugitive dust.			
		The noise and dust may cause local fisherman and tourists to find other locations on the lake to fish.			
Magnitude	Reversibility	Geographic Extent	Duration	Frequency	
Small	Reversible	Immediate	Short-term	Intermittent	
Residual Effects:		Insignificant			
Monitoring:		A health and safety officer with the contractor is on site.			
<b>Comments:</b> While workers may be exposed to hazards, the exposure can be limited through the use of appropriate personal protective equipment and restricting site access to authorized workers only. In addition, workers must follow the provincial Occupational Health and Safety Act and any other appropriate legislation, guidelines, or best management practices. The prime contractor will have a health and safety plan that is to be approved by PWGSC personnel. There are no known contaminated soils at site.					
The noise and dust may cause local fisherman and tourists to find other places on the lake to fish. This will be for a short period of time and will not affect the local recreational fishing.					



## **D: CONSULTATIONS**

### ***Public Consultation***

The potential for public concern is minimal due to the size and insignificant impacts of the project. Public consultation was not deemed necessary as part of this screening.

### ***Aboriginal Consultation***

Aboriginal consultation is completed by the provincial government during their assessment of the work prior to an approval or notification is granted to the proponent. This consists of Treaty 8 community members and those individual First Nations who are not part of Treaty 8.

### ***Government Consultation***

Provincial authorities likely to have an interest in the project were consulted by Public Works & Government Services Canada, Environmental Services, during the course of this environmental effects evaluation. A project description was distributed to the provincial authorities in order to garner expert advice. These authorities included:

- BC Provincial Ministry of Forests, Lands and Natural Resources Operations

As a result of this consultation, BC MFLNRO will provide expert advice that will be part of the notification/approval document.

## **PART E: ENVIRONMENTAL EFFECTS EVALUATION CONCLUSION**

### ***Significant Adverse Environmental Effect***

Potential impacts of this project are associated with construction disturbances. It is reasonable to conclude that with appropriate mitigation in place and good work practices, environmental effects will be of short duration and the potential zone of influence will be confined to the immediate vicinity of the work.

### ***Mitigation***

- Ensure that all works near water have proper siltation and erosion control.
- Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures are to be used as appropriate to prevent erosion and release of sediments and/or sediment laden water during the construction phase. These structures are to be left in place until vegetation is re-established and/or all exposed soils are stabilized.
- The exposed soil area must be minimized by limiting the area that is exposed at one time and by limiting the time that any one area is exposed. All stockpiled soil must be covered and/or dyked to prevent erosion and release of sediment laden water. Wherever possible, exposed soil is to be replanted or sodded to ensure soil stabilization.
- Follow the BC MOE document “Standards and Best Practices for Instream Works” to ensure compliance with the provincial ministry.
- Ensure the BC MOE approval or notification for works is available on site and ensure compliance with all the terms and conditions of this document.
- Ensure there are appropriate spill kits on all equipment and available to the operators at all times.
- All waste materials must be disposed of in a provincially approved manner so as to mitigate potential effects generated by leachate entering the adjacent waters.
- If any construction debris/material (eg plastic, food scraps ect.) enter the aquatic environment they must be removed immediately and disposed of in a provincially approved manner.
- Onsite personnel must ensure food scraps and garbage are not left at the project site.
- Disturbance to wildlife in and near the project area should be avoided where possible.
- The contractor must prevent hydrocarbon product releases in and around the project area.
- Workers who come in contact with hazards must be provided with and use appropriate personal protective equipment.
- Site access must be restricted to authorized personnel only.
- Dust suppression measures must be applied to prevent fugitive dust.
- Any and all stipulations of federal, provincial, or municipal authorities and/or their officers must be strictly followed. As a best practice the most stringent standards must be used where applicable. Any discrepancies must be successfully resolved before the pertinent work may begin.

## **PART F: ACCURACY AND COMPLIANCE MONITORING**

Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request.

## **Environmental Effects Evaluation (EEE) Report – Muncho Lake Roadside Stabilization**

### **PART G: DETERMINATION**

The federal authority is required to provide a determination of the significance of environmental effects as a result of this project. The decision outlined below is based on the interpretation of environmental effects and mitigation measures described in Part D of this report.

**Project Name:** Muncho Lake Roadside Stabilization Project  
**PWGSC Project #:** R.017173.030  
**Location:** Three locations along Muncho Lake, British Columbia

The Federal Authority has evaluated the project for significant adverse environmental effects as required under Section 67 of *Canadian Environmental Assessment Act (CEAA), 2012*. On the basis of this evaluation, the department has determined that the decision opposite the "X" applies to the proposed project.

- ☐ Project not likely to cause significant adverse environmental effects - proceed.
- ☒ Project not likely to cause significant adverse environmental effects with mitigation - proceed using mitigative measures as determined.
- ☐ Inadequate information available - further study and assessment is required.
- ☐ Project likely to cause significant adverse environmental effects that cannot be justified in the circumstances - project will not proceed.
- ☐ Project likely to cause significant adverse environmental effects that may be justified in the circumstances - refer to the Governor in Council for decision.

### **PART H: SIGNATURE CERTIFICATE**

This document summarizes the results of an environmental effects evaluation related to the above project that has been performed and completed by the Federal Authority in accordance with the *Canadian Environmental Assessment Act, 2012*.

**Environmental Specialist:** Laurie Crawford \_\_\_\_\_ **Date:** \_\_\_\_\_  
Alaska Highway Environmental Coordinator, Environmental Services, PWGSC, Western

*The above has completed this environmental effects evaluation (EEE) report to the best of their ability and knowledge, and ensures that it meets the requirement of the Canadian Environmental Assessment Act, 2012.*

**Project Manager:** Alex Taheri \_\_\_\_\_ **Date:** \_\_\_\_\_  
Real Property Services, PWGSC, Pacific

*The above has read and understood this environmental effects evaluation (EEE) report and acknowledges responsibility for ensuring the implementation of mitigation measures and for ensuring the design and implementation of 'accuracy and compliance monitoring', if any, identified in this report.*

-

## **APPENDIX A**

### **FIGURES**



**Public Works and  
Government Services  
Canada  
Pacific Region**

**Travaux publics et  
Services gouvernementaux  
Canada  
Région du Pacifique**

# **MUNCHO LAKE ROADSIDE STABILIZATION RETAINING WALLS**

**ALASKA HIGHWAY  
BRITISH COLUMBIA**

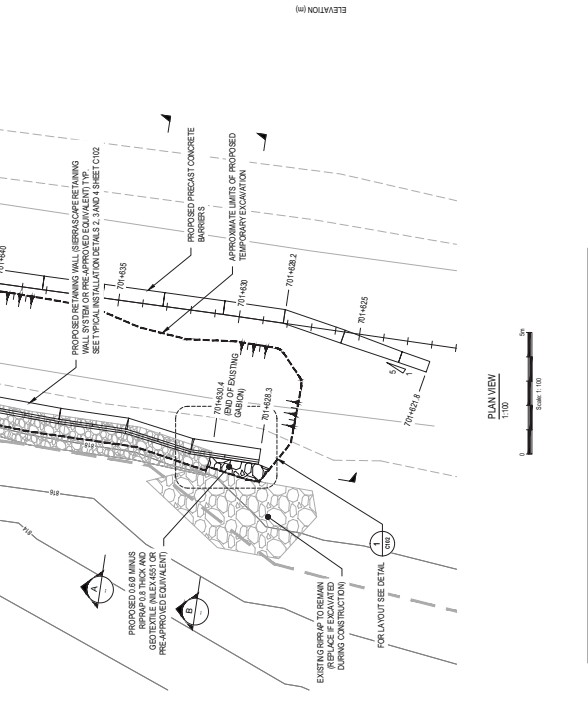
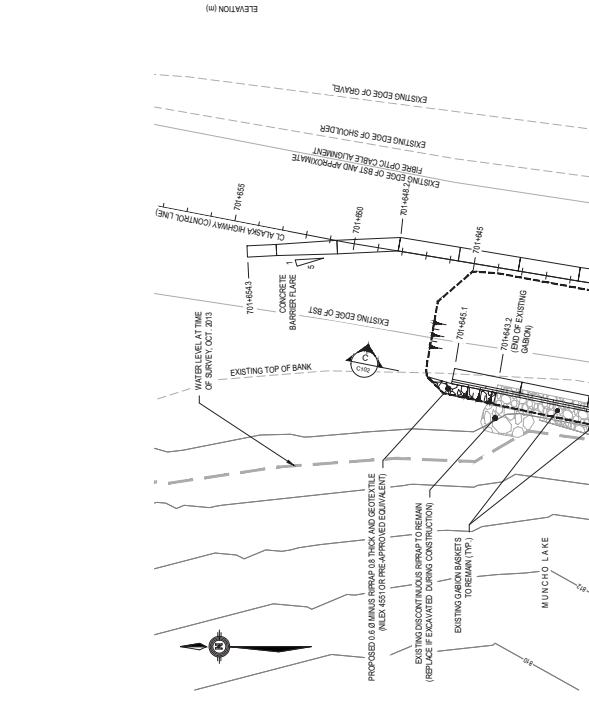


**TETRA TECH EBA**

**PROJECT No. R017173.030**

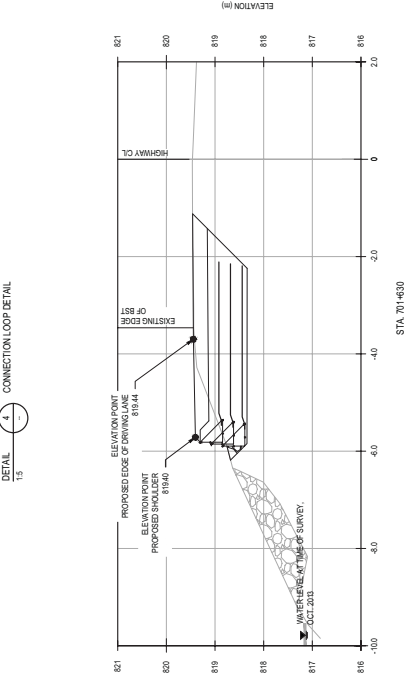
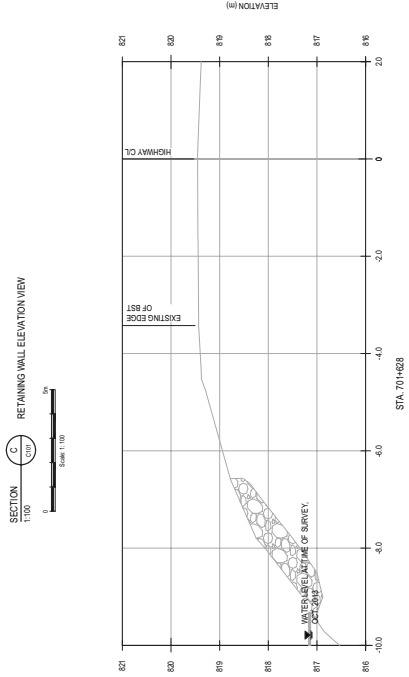
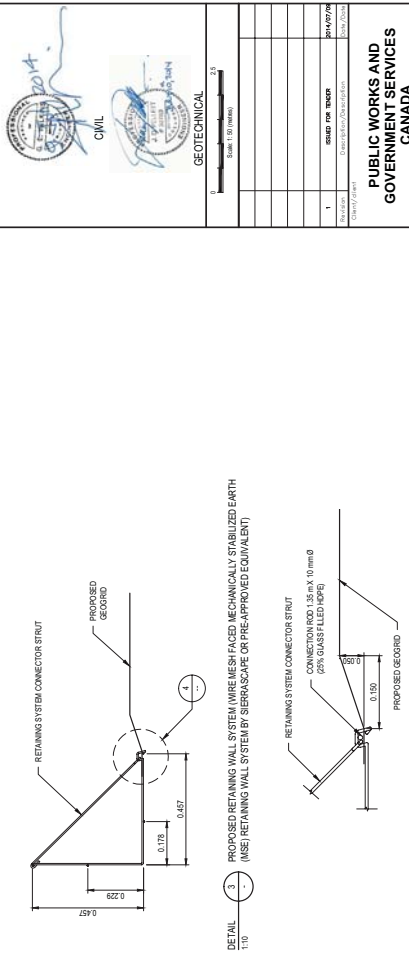
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JULY 2014**





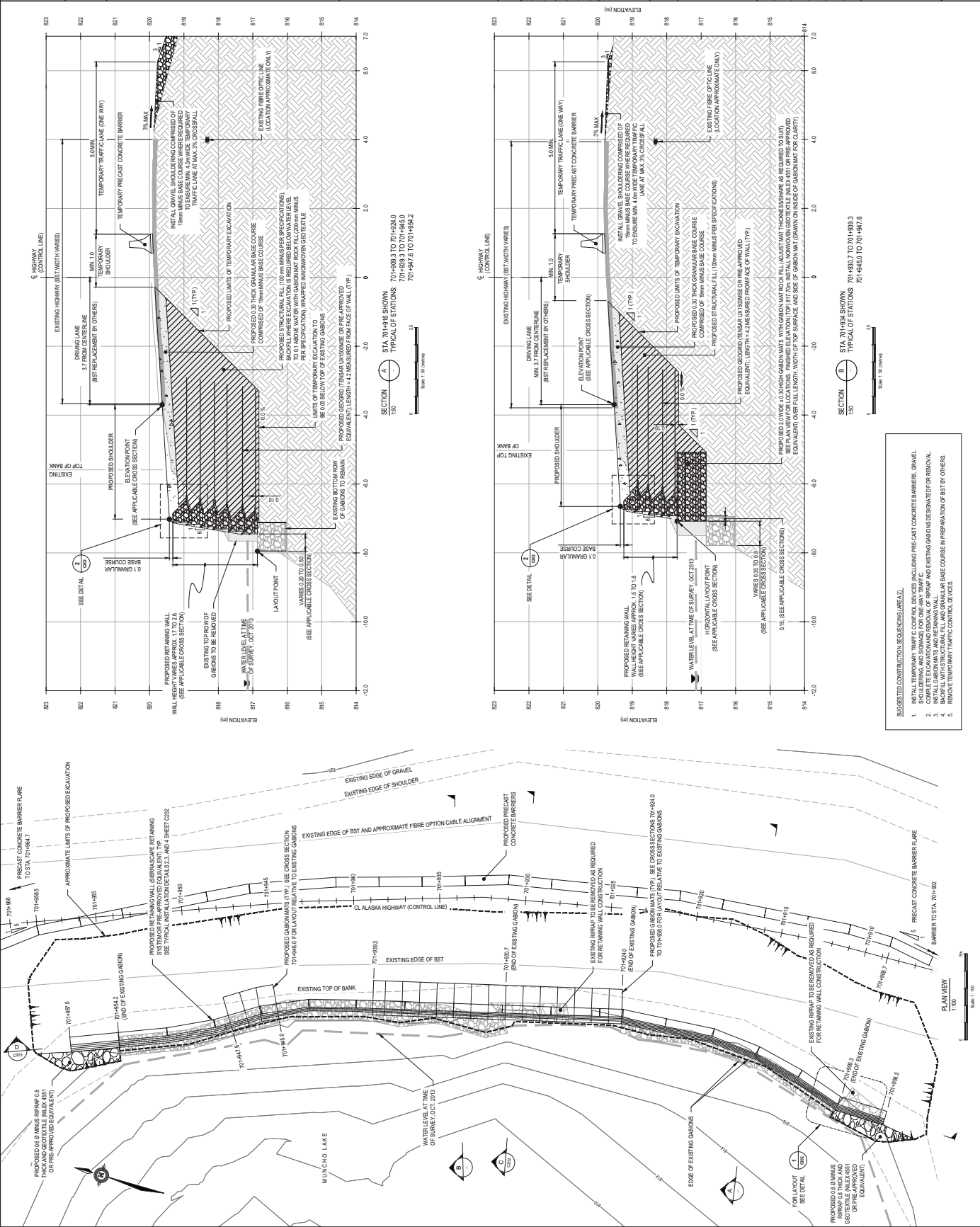
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2. COMPLETE EDUCATION.
3. INSTALL NETWORKING.
4. INSTALL STRUCTURAL FILL AND GRANULAR BASE COURSE IN PREPARATION OF BIST BY OTHERS.
5. REMOVE TEMPORARY TRAFFIC CONTROL DEVICES.





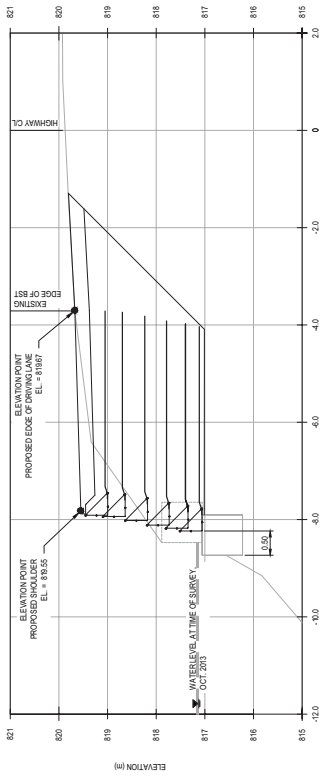




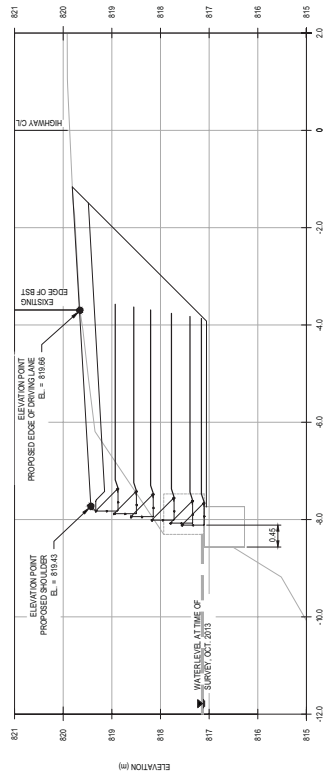




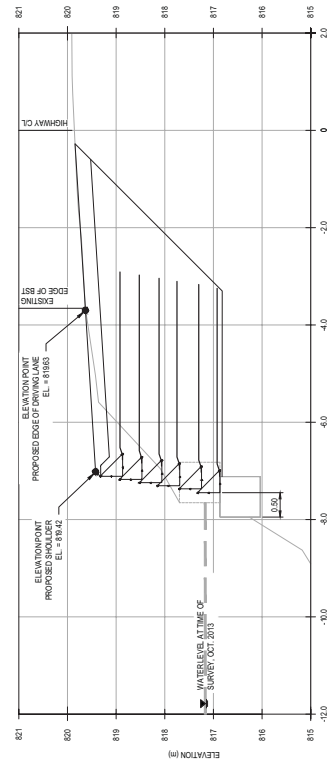




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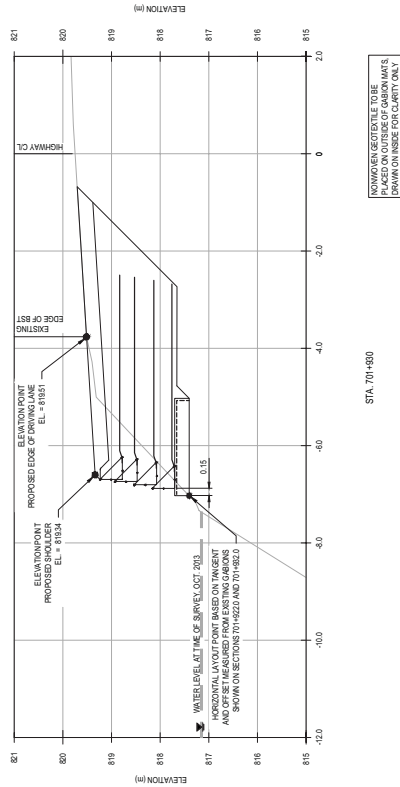


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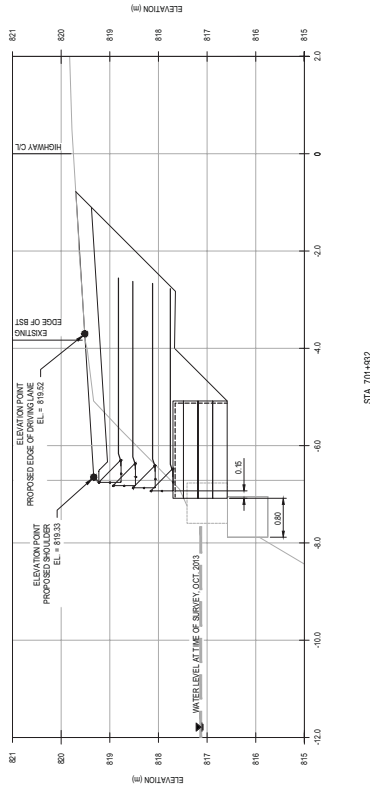


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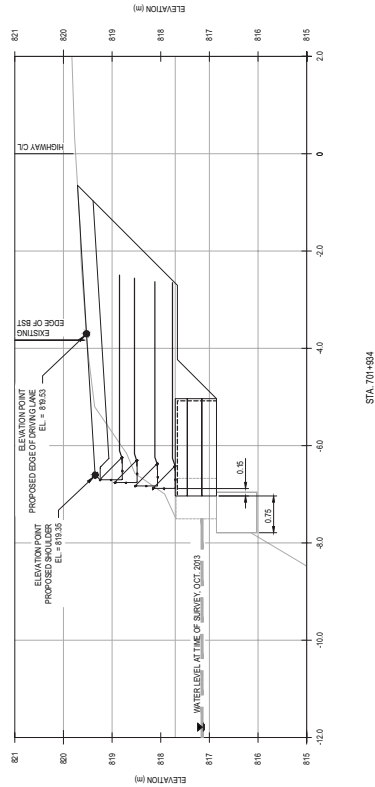
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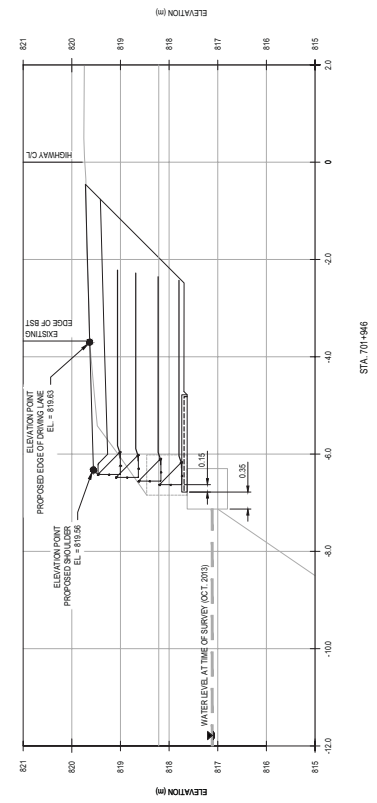
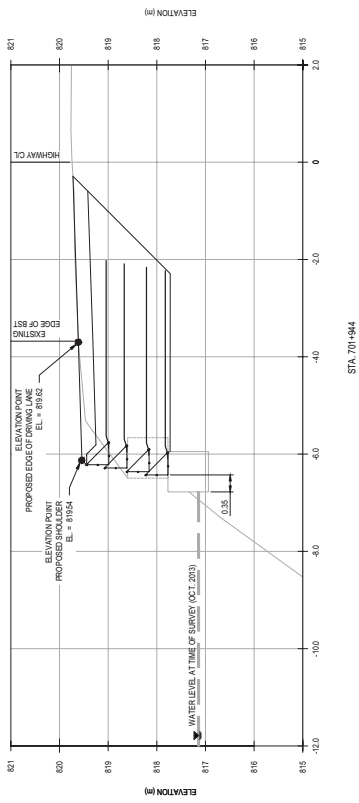
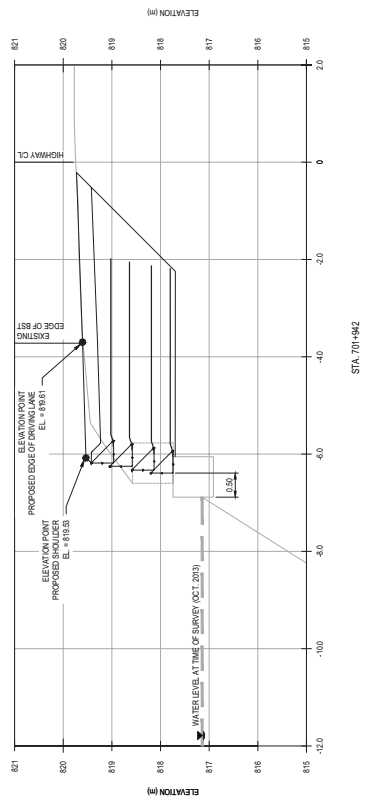
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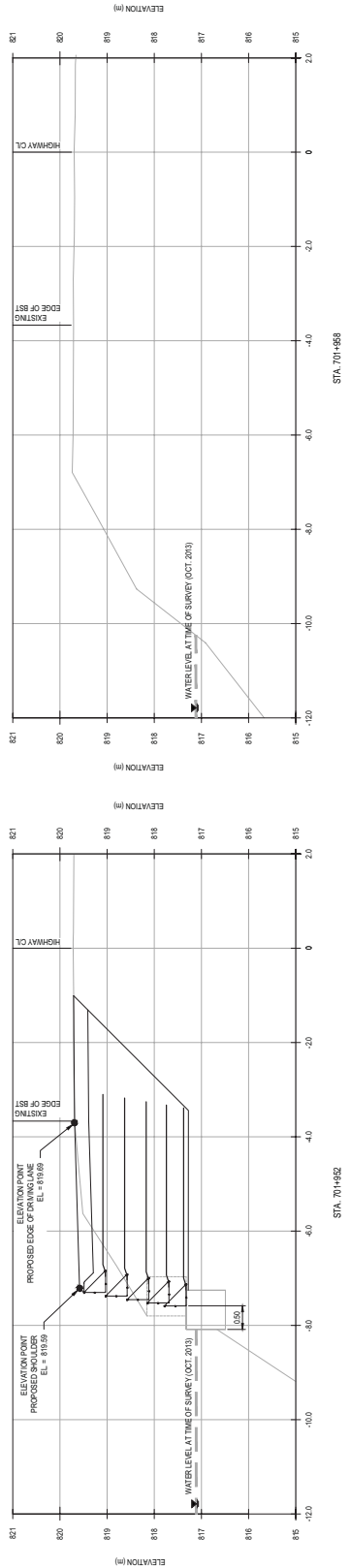
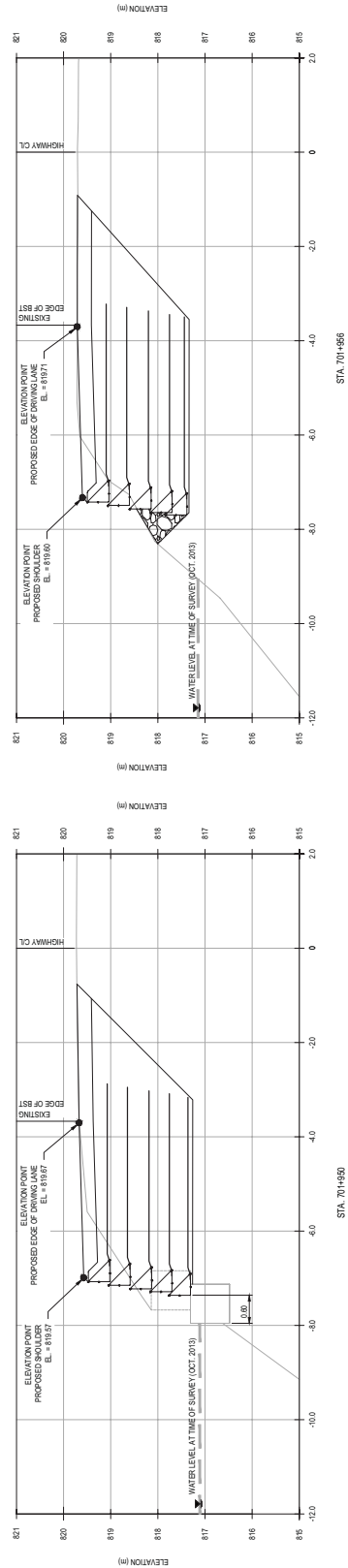


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Project No./No. du projet	Sheet/Fauille	Revision no./ La révision no.
R017173.030	C205 OF C303	1

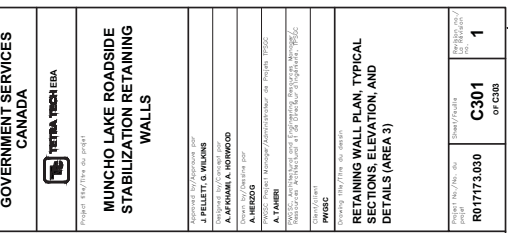
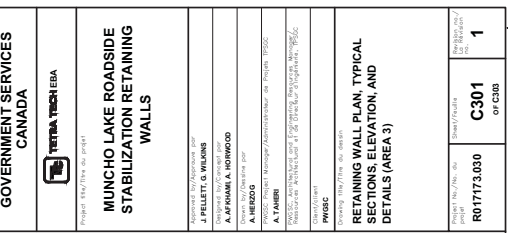
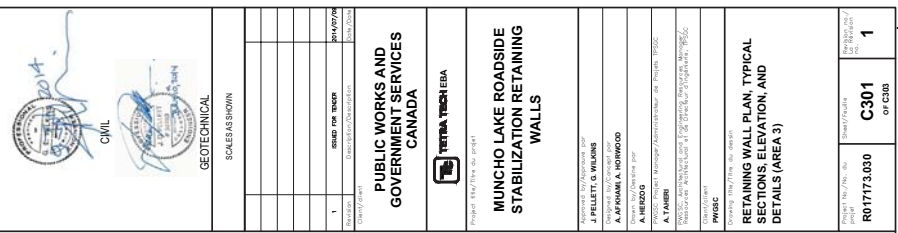






PWGSC - A1 - 841x594





1. INSTALL TEMPORARY TRAFFIC CONTROL DEVICES INCLUDING PRE-CAST CONCRETE BARRIERS, GRADUAL SHOULDERING, AND SUFFICIENT SPACE FOR ONE-WAY TRAFFIC.
2. COMPLETE ELEVATION AND REMOVE EXISTING REPAIR WITHIN CONSTRUCTION LIMITS.
3. INSTALL GABION MATS AND RETAINING WALL.
4. BACKFILL WITH STRUCTURAL FILL AND CONSUMABLE BASE COURSE IN PREPARATION OF BS1 BY OTHERS.
5. REMOVE TEMPORARY TRAFFIC CONTROL DEVICES.





**APPENDIX B**  
**RECORD OF PUBLIC PARTICIPATION DETERMINATION**

## Record of Public Participation Determination

**Stage of work plan:** Early planning phase of screening (pre-scoping)

Is there an indication that...	Describe potential indication and issues	Consider public participation?	
<i>Is there an existing or likely public interest in the type, location or potential effects of the project?</i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>There are members of the public with a history of being involved in past proposed projects in the area?</i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>The project has the potential to generate conflict between environmental and social or economic values of concern to the public?</i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>The project may be <u>perceived</u> as having the potential for significant adverse environmental effects? <sup>4</sup></i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>There is potential to learn from community ecological? Knowledge or Aboriginal traditional knowledge?</i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>There is uncertainty about potential direct and indirect environmental effects or the significance of identified effects?</i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>The project has been or will be subject to other public participation processes that would meet the objectives of the Ministerial Guideline <a href="http://www.ceaa.gc.ca/013/006/ministerial_guideline_e.htm">http://www.ceaa.gc.ca/013/006/ministerial_guideline_e.htm</a></i>		<input type="checkbox"/> Yes	<b>X No</b>
<i>There is any other reason why public participation is or is not appropriate?</i>		<input type="checkbox"/> Yes	<b>X No</b>

**As a result of the scan above, is public participation under CEAA appropriate in the circumstances?**

☐ Yes

**X No**

**Additional comments to support determination:**

This project is of a very small scope however, is vital in keeping the Alaska Highway Corridor infrastructure open for transportation. This highway infrastructure is already in place but requires small repairs to the current shoreline erosion of highway embankment.

<sup>4</sup> Environmental Effect as per the definition in CEAA (2012) is

- Changes to the environment to components of the environment that are within the legislative authority of Parliament (fish as defined by the Fisheries Act, aquatic species under the Species at Risk Act, and migratory birds as defined in the Migratory Birds Convention Act (1994))
- Changes to the environment that occur on federal lands, or inter-provincially or outside of Canada.
- The effect of any change on health and socio-economic condition, physical and cultural heritage, use of resources for traditional purposes and structures of historical significance are limited with respect to Aboriginal peoples.

## **APPENDIX C**

### **DEFINITIONS AND METHODOLOGIES**

Environment (defined in S.2(1)) – the components of the Earth, and includes land, water and air, including all layers of the atmosphere; and all organic and inorganic matter and living organisms (and the interacting natural systems of those).

Environmental Effects (defined in S.5(1) and 5(2)) – (a) a change that may be caused to the following components of the environment that are within the legislative authority of Parliament:

- Fish as defined in section 2 of the *Fisheries Act* and fish habitat as defined in subsection 34(1) of that Act,
- Aquatic species as defined in subsection 2(1) of the *Species at Risk Act (SARA)*,
- Migratory birds as defined in subsection 2(1) of the *Migratory Birds Convention Act, 1994*, and
- Any other component of the environment that is set out in Schedule 2.

(b) a change that may be caused to the environment that would occur on federal lands, or inter-provincially, or outside Canada; and

(c) with respect to aboriginal peoples, the effect of any change on health and socio-economic conditions, physical and cultural heritage, the current use of lands and resources for traditional purposes, or any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Federal Authority (defined in S.2(1)) – a Minister of the Crown in right of Canada; an agency of the Government of Canada or a parent Crown corporation, as defined in subsection 83(1) of the *Financial Administration Act (FAA)*; or any department or departmental corporation that is set out in Schedule I or II to the FAA.

Federal lands (defined in S.2(1)) – defined as follows:

- lands that belong to Her Majesty in right of Canada, or that Canada has power to dispose of, and all waters on and airspace above those lands, other than lands under the administration and control of the Commissioner of Yukon, the Northwest Territories or Nunavut;
- the internal waters of Canada, in any area of the sea not within a province;
- the territorial sea of Canada in any area of the sea not within a province;
- the exclusive economic zone of Canada, and the continental shelf of Canada; and
- reserves, surrendered lands and any other lands that are set apart for the use and benefit of a band and that are subject to the *Indian Act*, and all waters on and airspace above those reserves or lands.

Mitigation measures (defined in S. 2(1)) – measures for the elimination, reduction or control of the adverse environmental effects of a designated project, and includes restitution for any damage to the environment caused by those effects through replacement, restoration, compensation or any other means.

Project (defined in S. 66) – a physical activity that is carried out in relation to a physical work and is not a designated project.

Valued Ecosystem Component (defined on Agency - [www.ceaa.gc.ca/default.asp?lang=En&n=B7CA71391&offset=3#v](http://www.ceaa.gc.ca/default.asp?lang=En&n=B7CA71391&offset=3#v)) - The environmental element of an ecosystem that is identified as having scientific, social, cultural, economic, historical, archaeological or aesthetic importance.

The value of an ecosystem component may be determined on the basis of cultural ideals or scientific concern. Valued ecosystem components that have the potential to interact with project components should be included in the assessment of environmental effects.

### **Methodology**

The environmental effects evaluation methodology used in this report focuses the evaluation on those environmental components of greatest concern. The Valued Ecological Components (VECs) most likely to be affected by the project as described are indicated in **Table 1**. VECs were selected based on ecological importance to the existing environment (above), the relative sensitivity of environmental components to project influences and their relative social, cultural or economic importance. The potential impacts resulting from these interactions are described below.

### ***Evaluation of Environmental Effects***

The VECs selected in Table 1 are addressed in Tables 2.1 through 2.16\* in the EEE. The residual effects of the project on the environment are defined. Similarly, the physical works/activities and required mitigation measures are detailed and the significance of residual (post-mitigation) effects is estimated.

The following ratings are based on:

- **information provided by the proponent;**
- **a review of project related activities;**
- **an appraisal of the environmental setting, and identification of resources at risk;**
- **the identification of potential impacts within the temporal and spatial bounds; and**
- **personal knowledge and professional judgment of the assessor.**

The significance of project related impacts was determined in consideration of their frequency, the duration and geographical extent of the effects, magnitude relative to natural or background levels, and whether the effects are reversible or are positive or negative in nature. These criteria are indicated in Table 2.

**Table 3. Assessment Criteria for Determination of Significance.**

<b>Magnitude</b>	Magnitude, in general terms, may vary among Issues, but is a factor that accounts for size, intensity, concentration, importance, volume and social or monetary value. It is rated as compared with background conditions, protective standards or normal variability.	
	Small	Relative to natural or background levels
	Moderate	Relative to natural or background levels
	Large	Relative to natural or background levels
<b>Reversibility</b>	Reversible	Effect can be reversed
	Irreversible	Effects are permanent
<b>Geographic Extent</b>	Immediate	Confined to project site
	Local	Effects beyond immediate project site but not regional in scale
	Regional	Effects on a wide scale
<b>Duration</b>	Short Term	Between 0 and 6 months in duration
	Medium Term	Between 6 months and 2 years
	Long Term	Beyond 2 years



<b>Frequency</b>	Once	Occurs only once
	Intermittent	Occurs occasionally at irregular intervals
	Continuous	Occurs on a regular basis and regular intervals

**APPENDIX D**  
**MITIGATION TABLE**

Environmental Component	Reference	VANOC Commitment	Phase	Responsibility
Responsible Environmental Management	1.1	Design, construct and commission Project in an environmentally responsible manner, and employ Best Management Practices (BMPs) and comply with federal, provincial and municipal statutes.	Pre Construction	PWGSC Contractors
	1.2	Ensure that required Permits, Approvals and Authorizations are in place before proceeding to construction.	Pre Construction Construction	PWGSC
	1.3	Contractor to prepare a final version of a construction-phase Environmental Protection Plan (EPP), prior to the start of construction. The EPP will provide contractors and on-site workers with procedures and requirements for meeting Permits, Approvals and Authorizations and for carrying out on-site activities using accepted BMPs. The EPP will be updated as required.	Pre Construction	Contractors
	1.4	Engage an Environmental Monitor for the construction phase of the Project. The Environmental Monitor will undertake regular environmental monitoring activities, and will ensure the implementation of the EEE terms and conditions for the Project. The Environmental Monitor will review, evaluate, and report to PWGSC on the construction activities and the effectiveness of the environmental control strategies and mitigation measures, with respect to the terms and conditions of the Screening Report, the EPP and other regulatory Permits, Approvals and Authorizations that may apply.	Construction	Contractors PWGSC
Hydrogeology and Groundwater	1.5	Provide relevant federal and provincial agencies with final design plans for the Whistler Nordic Centre Part B for review prior to construction of the Project.	Pre Construction	PWGSC
	2.1	No mitigation required	N/A	N/A
	3.1	Provide 30 m setbacks for fish-bearing streams and 15 m for non-fish bearing streams wherever possible	Construction Operations	Contractor

### **Mitigation Table – to be forwarded to proponent**

It is reasonable to conclude that with appropriate mitigation in place and good work practices, significant adverse environmental effects will be of short duration and the potential zone of influence will be confined to the immediate vicinity if the work.

#### ***Mitigation***

- Ensure that all works near water have proper siltation and erosion control.
- Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures are to be used as appropriate to prevent erosion and release of sediments and/or sediment laden water during the construction phase. These structures are to be left in place until vegetation is re-established and/or all exposed soils are stabilized.
- The exposed soil area must be minimized by limiting the area that is exposed at one time and by limiting the time that any one area is exposed. All stockpiled soil must be covered and/or dyked to prevent erosion and release of sediment laden water. Wherever possible, exposed soil is to be replanted or sodded to ensure soil stabilization.
- Follow the BC MOE document “Standards and Best Practices for Instream Works” to ensure compliance with the provincial ministry.
- Ensure the BC MOE Notification for works is available on site and ensure compliance with all the terms and conditions of this document.
- Ensure there are appropriate spill kits on all equipment and available to the operators at all times.
- All waste materials must be disposed of in a provincially approved manner so as to mitigate potential effects generated by leachate entering the adjacent waters.
- If any construction debris/material (eg plastic, food scraps ect.) enter the aquatic environment they must be removed immediately and disposed of in a provincially approved manner.
- Onsite personnel must ensure food scraps and garbage are not left at the project site.
- Disturbance to wildlife in and near the project area should be avoided where possible.
- The contractor must prevent hydrocarbon product releases in and around the project area.
- Workers who come in contact with hazards must be provided with and use appropriate personal protective equipment.
- Site access must be restricted to authorized personnel only.
- Dust suppression measures must be applied to prevent fugitive dust.
- The noise and dust may cause local fisherman and tourists to find other locations on the lake to fish.
- Any and all stipulations of federal, provincial, or municipal authorities and/or their officers must be strictly followed. As a best practice the most stringent standards must be used where applicable. Any discrepancies must be successfully resolved before the pertinent work may begin.
- Any and all stipulations of federal, provincial, or municipal authorities and/or their officers must be

strictly followed. As a best practice the most stringent standards must be used where applicable. Any discrepancies must be successfully resolved before the pertinent work may begin.
<b>Site monitoring (accuracy and compliance monitoring) may be conducted to verify whether required mitigation measures were implemented. The proponent must provide site access to Responsible Authority officials and/or its agents upon request</b>