

RETURN BIDS TO:
RETOURNER LES SOUMISSIONS À:
Bid Receiving Public Works and Government
Services Canada/Réception des soumissions
Travaux publics et Services gouvernementaux
Canada
800 Burrard Street, Room 219
800, rue Burrard, pièce 219
Vancouver
British Columbia
V6Z 0B9
Bid Fax: (604) 775-9381

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
Raison sociale et adresse du
fournisseur/de l'entrepreneur

Issuing Office - Bureau de distribution
Public Works and Government Services Canada -
Pacific Region
800 Burrard Street, Room 219
800, rue Burrard, pièce 219
Vancouver
British C
V6Z 0B9

Title - Sujet Km742.5 to Km750.3 Hwy Realignment	
Solicitation No. - N° de l'invitation EZ899-152432/A	Amendment No. - N° modif. 001
Client Reference No. - N° de référence du client	Date 2015-04-22
GETS Reference No. - N° de référence de SEAG PW-\$PWY-020-7499	
File No. - N° de dossier PWY-4-37364 (020)	CCC No./N° CCC - FMS No./N° VME
Solicitation Closes - L'invitation prend fin at - à 02:00 PM on - le 2015-05-19	
F.O.B. - F.A.B. Plant-Usine: <input type="checkbox"/> Destination: <input checked="" type="checkbox"/> Other-Autre: <input type="checkbox"/>	
Address Enquiries to: - Adresser toutes questions à: Ly, Ronny(PWY)	Buyer Id - Id de l'acheteur pwy020
Telephone No. - N° de téléphone (604) 666-0043 ()	FAX No. - N° de FAX (604) 775-6633
Destination - of Goods, Services, and Construction: Destination - des biens, services et construction: PWGSC - Km742.5 to Km750.3 Alaska Highway, BC	

Instructions: See Herein

Instructions: Voir aux présentes

Delivery Required - Livraison exigée	Delivery Offered - Livraison proposée
Vendor/Firm Name and Address Raison sociale et adresse du fournisseur/de l'entrepreneur	
Telephone No. - N° de téléphone Facsimile No. - N° de télécopieur	
Name and title of person authorized to sign on behalf of Vendor/Firm (type or print) Nom et titre de la personne autorisée à signer au nom du fournisseur/ de l'entrepreneur (taper ou écrire en caractères d'imprimerie)	
Signature	Date

Solicitation No. - N° de l'invitation

EZ899-152432/A

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

Amd. No. - N° de la modif.

001

File No. - N° du dossier

PWY-4-37364

Buyer ID - Id de l'acheteur

pw020

CCC No./N° CCC - FMS No/ N° VME

This Amendment 001 is raised to include Appendix G - PWGSC Environmental Effects Evaluation (EEE) Report as referenced in Specification.

All other terms and conditions remain unchanged.



Environmental Effects Evaluation (EEE) Report

Sections 67 of the

Canadian Environmental Assessment Act, 2012

**REDESIGN AND CONSTRUCTION OF THE
ALASKA HIGHWAY, BRITISH COLUMBIA**

KM 737 to KM 750

**INCLUDING
STRIPPING AND EXCAVATION OF A CLEARED
GRANULAR SOURCE AT km 746.5
AND
CULVERT UPGRADES AT
KM 740.55, KM 742.15 AND KM 748.16**

PWGSC Project No. R.017173.055

Prepared by
Public Works and Government Services Canada –
Environmental Services, Winnipeg, MB
Environmental Services, Edmonton, AB

November 15, 2013
Revised March 29, 2015

Environmental Effects Evaluation (EEE) Report

TABLE OF CONTENTS

A.1 Background.....	2
B.1 Project Description.....	3
Site Preparation.....	5
Construction.....	5
Operation and maintenance	6
B.2 Scheduling.....	6
B.3 Regulatory.....	7
PART C: SCOPE OF EVALUATION.....	22
C.1 Environmental Setting.....	22
C.2 Physical Environment.....	22
C.3 Biological Environment.....	22
C.4 Socio-economic Environment.....	23
PART D: COMMUNICATIONS.....	33
D.1 Consideration of Public Concerns	33
D.2 Aboriginal Interest	33
D.3 Government Co-ordination.....	33
PART E: ENVIRONMENTAL EFFECTS EVALUATION CONCLUSION	34
PART F: ACCURACY AND COMPLIANCE MONITORING	34
PART G: DETERMINATION.....	34
PART H: SIGNATURE	35
PART I: REFERENCES.....	36

LIST OF TABLES

Table 1	Potential Project / Environment Interactions Matrix
Tables 2.1 – 2.4	Potential Project / Valued Ecosystem Interactions and Mitigation
Table 3	Assessment Criteria for Determination of Significance

LIST OF APPENDICES

Appendix A	Figures – See EBA Tender Information and Reports
Appendix B	Record of Public Participation Determination
Appendix C	Definitions and Methodologies
Appendix D	Mitigation Table

Environmental Effects Evaluation (EEE) Report

PART A: PROJECT INFORMATION

Project Title:	Environmental Effects Evaluation of the Design and Construction of Km 737-750 of the Alaska Highway, Stripping and Excavation of a Granular Source at Km 746.5, and Culvert Upgrades KM 740.55, KM 742.15 AND KM 748.16m under CEAA, 2012
Project Location:	Alaska Highway, British Columbia
Lead Federal Authority:	Public Works and Government Services Canada
Lead Authority contact:	Chris Doupe, Environmental Evaluation Biologist, PWGSC
Other FA's:	N/A
EEE Assessor contact:	Peggy Bainard Acheson, Senior Environmental Specialist, PWGSC Laurie Crawford, Environmental Coordinator, AHP, PWGSC (revised information on March 28, 2015)
PWGSC Project Number:	R.017173.055
Client contact:	Alex Taheri, Project Manager, PWGSC

A.1 Background

In 2010 PWGSC, Environmental Services, Western Region submitted a draft environmental screening report for the above-named project to Environmental Services, Pacific Region. The project did not move forward immediately and it is understood that the screening report was never signed off by Pacific Region. Since that time the new Canadian Environmental Assessment Act, (CEAA 2012) came into force as of July, 2012. The project is now in progress again for upgrades, however the north section (KM 742 to 750) will be completed this fiscal year, and the south section (KM 737 to 742) will be completed next fiscal year (2016/17). Tender packages for both upgrades will be put out for tender in February 2015. The project description was evaluated by Environmental Services again under the new Act, and it was determined that due to the potential notifications and/or permits/letters of authorization that may be required for the culvert upgrades and/or replacements, that an environmental effects evaluation (EEE) should be completed for the project under the new Act.

This report is based on information from the draft environmental screening report plus updates on regulatory requirements and progress on notifications to the British Columbia Ministry of Environment, the Department of Fisheries and Oceans, and Transport Canada.

PART B: SCOPE OF PROJECT

B.1 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*, 2012 (CEAA, 2012) for the development and implementation of an effective grade design for 13 km of the Alaska Highway in British Columbia, between Km 737 and Km 750. Major activities for the road re-alignment and upgrade include the following:

- the clearing, grubbing, stripping and excavation of a proposed granular source inside the existing highway right-of-way at Km 746.5,
- the upgrade/replacement of culverts passing under the highway at Km 740.55, Km 742.215 and Km 748.16 (Ed's Creek).

The intention is to use excavated borrow materials from KMs 746.2 to 746.8 in highway construction activities undertaken by PWGSC – Alaska Highway Program along the adjacent segments of the Alaska Highway (Km 737 to Km 750), all of which comprise the focus of this EEE.

The highway design and construction portion of this project involves the preliminary survey, the preliminary design and the geotechnical investigation, all of which are already complete, as well as the findings of this environmental effects evaluation, all of which will be incorporated into the detailed design. This portion of the Alaska Highway, between km 737 and 750, will be upgraded to meet the current Transportation Association of Canada (TAC) RAU100 highway design standards, as determined by a PWGSC design committee. The portion of highway to be upgraded lies between the Prochniak River Bridge (Km 736.865 is on the centreline of the North expansion joint of the Prochniak River Bridge as of 2001) and Km 750, which is approximately 12 km south of the Liard River Bridge and 13.5 km south of the Liard River Hot Springs.

Areas of concern associated with the proposed project include erosion from back slopes between Km 741.4 and 746.8, two fish-bearing creeks at Km 740.6 and 742.2, the replacement of a timber box culvert at Km 748.16 with a 3000 mm corrugated steel culvert, and alignment restrictions based on topographic features and agreements with the Department of Fisheries and Oceans in regards to the ponded areas around the culvert at 742.2.

The finished road top width of the base course top for this design is 15.76 m. The surface will be covered with chip material and the intended granular source will be from the large existing back slope cut located between Km 746.2 to 746.8. This cut is approximately 50 m high and passes through an old river terrace composed of alluvial deposits of granular material. The granular materials made available at this proposed granular source will be used for the highway construction activities along the adjacent segments of the Alaska Highway, including the construction activities along the portion of the highway between KMs 737 and 750 assessed in this report.

The proposed amount of surface material to be stripped from this area for high construction is 19,956 m³, while the volume of granular material to be excavated from the granular source for this project is approximately 828,017 m³ (100,000 m³ of this quantity will be for granular base). The proposed pit has approximately 300 to 500 mm of silty overburden that will be used to balance the under run on the common excavation from the right of way cuts.

For the purposes of this screening assessment, clearing is defined as cutting off trees, brushing vegetative growth to ground level, and disposing of felled trees, previously uprooted trees and stumps, as well as surface debris; clearing will also include the removal of branches and trees overhanging the cleared area as required for

Environmental Effects Evaluation (EEE) Report

safety. Similarly, grubbing is defined as excavating and disposing of stumps, roots and embedded logs to 150mm below the existing ground surface.

An access road to the granular source will be constructed prior to the commencement of construction work on the highway upgrades between km 737 to km 750; upon completion of all site work, the granular source location will contain part of the highway itself and, therefore, will not require rehabilitation measures.

Environmental Effects Evaluation (EEE) Report

	Core Project Components	Ancillary Works Other Projects & Activities
<i>Site Preparation</i>	<p>Granular source clearing, grubbing, stripping and excavation component of this project involves:</p> <ul style="list-style-type: none"> • the mobilization and demobilization of personnel, equipment, camp, buildings, shops, office, supplies and incidentals to and from the project site; • the coordination of progress schedules, submittals, use of site, temporary utilities, construction facilities ; • the preparation and submittal of shop drawings, product data, samples, certificates and transcripts; • construction of an access roadway, 6m in width, from the adjacent segment of the A-H to the granular source; • clearing, grubbing, stripping and excavation at the subject site based on horizontal measurements within the limits indicated in the project spec; • the management of fires, waste disposal, drainage, site clearing activities, plant protection, work adjacent to waterways, pollution control measures and occupational health and safety as they relate to project-related activities; 	<ul style="list-style-type: none"> • installation and removal of temporary access road • removal and disposal of all waste materials associated with the project by any of the following means: chipping, burning, mulching and spreading, burial on-site and timber salvage
<i>Construction</i>	<p>The highway construction component of this project involves:</p> <ul style="list-style-type: none"> • highway upgrade and minimal modification of the existing highway alignment, as per PWGSC design and drawings issued March 2010, to satisfy current highway design standards (TAC RAU 100) 	

Environmental Effects Evaluation (EEE) Report

	<p>The culvert upgrade component of this project includes:</p> <ul style="list-style-type: none"> • the permanent diversion of the existing stream at Km 740.6 to establish a creek bed with a gentler slope (2.0%); • the removal of the existing fish ladder at Km 740.610; • the addition of an overflow culvert, the extension of an existing culvert, the removal of an abandoned culvert, and some channeling for a creek bed for the fish creek at Km 742.2; and • the replacement of the existing culvert at Km 748.2 with a round, 3000 mm culvert which will meet drainage and runoff requirements • the installation of culverts at Km 737.8, 738.30, 739.230, 740.55, 740.550, 741.400, 741.150, 743.000, 742.260, extend culvert at 742.150, 743.000, 744.350, 745.750, 745.925, 746.430, 746.800, 747.130, 747.425, 747.700, 748.400, • the removal of culverts at Km 737.130, Km 738.675, Km 738.600, 739.225, 740.610, 741.300, 742.955, 742.110, 743.200, 743.800, 743.930, 744.100, 744.275, 744.320, 744.750, 746.430, 746.575, 746.800, 747.100, 747.330, 747.525, 748.500, 748.900, 	
<p><i>Operation and maintenance</i></p>	<p>Potential monitoring at culvert upgrades and installations where applicable.</p>	

B.2 Scheduling

The projected time for start of construction is May, 2015. The project will be executed as follows:

KM 737 – 743: Spring/summer 2015. Project completion is expected for October 2015. BST will not be completed on this section until the following year after the completion of section 743 to 750. In water culvert work will be completed either in the window of reduced risk (July 15 to August 15) or during low flow conditions depending on weather conditions.

KM 743 – 750: Spring/summer 2016. Since the stream (Ed’s Creek) at KM 748.155 is non fish-bearing, work may commence at this site as determined by the specifications with timing at the discretion of the site supervisor and environmental monitor preferably following spring freshet and when stream flow is at its lowest. Project completion is expected in October 2016.

Environmental Effects Evaluation (EEE) Report

B.3 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 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;

Environmental Effects Evaluation (EEE) Report

- 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.

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.

Environmental Effects Evaluation (EEE) Report

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 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.

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:

Environmental Effects Evaluation (EEE) Report

- 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

- 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;

Environmental Effects Evaluation (EEE) Report

"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.

These works have received both site assessments and approvals during previous site visits and meetings with DFO. All DFO comments and recommendations have been incorporated into the current design. The changes to the DFO legislation regarding the regulatory review process has placed more responsibility on the proponent to independently assess and mitigate potential impacts under terms of DFO's Risk Management Framework (2010). This work falls under a DFO self assessment review *Measures to Avoid Harm* (formerly known as Notification to DFO). PWGSC environmental services has completed the *PWGSC Low Risk Form* under the *PWGSC Protocol for Protecting Fish and Fish Habitat on the Alaska Highway* and has found that the project will not cause adverse effects to the fish and fish habitat within the project area. Any potential impacts are mitigable under the site specific construction activities Environmental Protection Plan. In this specific case, DFO has previously been involved in the review and final design for the culvert areas.

Navigation Protection Act

The new *Navigation Protection Act* (NPA) will replace the *Navigable Waters Protection Act* (NWPA). The existing provisions and requirements of the NWPA will remain in place until the amending legislation comes into force (anticipated Spring 2014). If construction of a work in a navigable water will commence **prior to April 1, 2014** then the provisions under the current [Navigable Waters Protection Act](#) apply.

Or, if it is anticipated that the proposed project may commence construction and require an application for review on or **after April 1, 2014**, then the NPA will likely apply and the NWPA will no longer be applicable to your project.

For this project it will be assumed that the project will begin construction after April 2014.

In 2009 amendments to the NWPA introduced the Minor Works Order, which enabled low risk works to be pre-approved. The Minor Works Order is now undergoing further amendments which are expected to be published in the Canada Gazette in Spring 2013. The amendments to the Order will include not only criteria for permanent works; it will also include specific criteria for the construction and ongoing maintenance and repairs for the life of the affected works. Classes applicable to this project might include The Erosion Protection Class, Dredging, and Minor Repairs.

The draft amended Minor Works Order may also provide general guidelines applicable to all classes of works including temporary works.

The new NPA will list the waterways where approval will be 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.

Works for this project will not fall under approval for NPA.

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

Environmental Effects Evaluation (EEE) Report

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:

- (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

Environmental Effects Evaluation (EEE) Report

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.

The below chart indicates those species that may be in the area however, are unlikely to be affected by the works. This is an already existing functional highway corridor that will be realigned closely to the original current highway alignment. It is not expected to disturb or cause impacts to any SARA or BC Endangered Species and Ecosystems (red or blue lists).

Scientific Name	Common Name	BC Endangered Species and Ecosystems	SARA Schedule 1	COSEWIC	Habitat Description and Comments
<i>Ammodramus leconteii</i>	Le Conte's Sparrow	Blue (2009)		NAR (1998)	Habitat is in tall grass, weedy meadows and marsh areas.
<i>Ammodramus nelsoni</i>	Nelson's Sparrow	Red (2009)	SC (2005)	SC (2012)	A secretive sparrow with a brightly-colored face, the Nelson's Sparrow breeds along the edges of freshwater marshes and in wet meadows of interior North America, and in salt marshes along the northern Atlantic Coast.
<i>Anaxyrus boreas</i>	Western Toad	Blue (2010)	SC (2005)	SC (2012)	The Western Toad will breed in an impressive range of natural and artificial habitats-from the shallow margins of lakes to roadside ditches. It does not seem to matter if the sites have tree or shrub canopy cover, coarse woody debris, or emergent vegetation. Adult toads can be found in forested areas, wet shrublands, avalanche slopes, and meadows. They appear to favour dense shrub cover, or perhaps provide protection from predators and desiccation. Western Toads are often found in clear cuts, and may prefer this habitat to closed canopy forests in coastal areas. The habitat requirements of hibernation sites for the Western Toad in Canada are not known.
<i>Asio flammeus</i>	Short-eared Owl	Blue (2009)	SC (2012)	SC (2008)	Nests in the boreal forests and prefers the shores of wetlands such as slow moving streams, peat bogs, marshes, swamps, beaver ponds and pasture edges. This owl breeds in every Canadian province and territory. It inhabits extensive areas of open habitats including marshlands, estuaries and grasslands, but is absent from the heavily forested areas. Habitat losses have resulted in a relatively steep, long term decline in Canada. Small numbers breed in the Fraser Valley and the south central interior. The owl nests on the ground under low shrubs, reeds or grasses, and usually near water. When not breeding short-eared owls are nomadic, roaming extensive ranges while hunting for small mammals and birds. Loss and fragmentation of habitat due to urban development and agricultural intensification are considered the primary threats.
<i>Bartramia longicauda</i>	Upland Sandpiper	Red (2009)	NA	NA	A shorebird of grasslands, not shores, the Upland Sandpiper inhabits native prairie and other open grassy areas in North America. Once abundant in the Great Plains, it has undergone steady population declines since the mid-19th century, because of hunting and loss of habitat.
<i>Bos bison athabasca</i>	Wood Bison	Red (2010)	SC (2013)	T (2003)	Wood bison are found in the open boreal and aspen forest where there are large wet meadows and slight depressions caused by ancient lakes.

Environmental Effects Evaluation (EEE) Report

Scientific Name	Common Name	BC Endangered Species and Ecosystems	SARA Schedule 1	COSEWIC	Habitat Description and Comments
					Historical estimates suggest that there were once over 168,000 wood bison in Canada. Today the wood bison populations in Canada are estimated at around 10,000 animals. In the 1970s, about 50 imported Plains Bison escaped to the wild in the Pink Mountain area, and that population has grown to over 1000 head. Wood Bison have become established in northeast British Columbia as a result of reintroductions and reintroduced animals from Mackenzie Territory and Alberta moving into the province. In 1999, there were about 80 to 100 Wood Bison in three herds in British Columbia; an additional 100 Bison occupy the Hay-Zama area in British Columbia and Alberta.
Botaurus lentiginosus	American Bittern	Blue (2010)	NA	NA	Habitat is marshes, tules, and reedy lakes.
Buteo platypterus	Broad-winged Hawk	Blue (2009)	NA	NA	Habitat is in mixed woodlands and groves.
Buteo swainsoni	Swainson's Hawk	Red (2009)	NA	NA	Habitat is on dry plains, open foothills, alpine meadows, rangeland, open forest, sparse trees.
Cardellina canadensis	Canada Warbler	Blue (2011)	T (2010)	T (2008)	Found in a variety of forest types, but most abundant in wet, mixed deciduous-coniferous forest with a well-developed shrub layer. Also found in riparian shrub forests and in ravines and old-growth forests with canopy openings and a high density of shrubs.
Chondestes grammacus	Lark Sparrow	Red (2010)	NA	NA	Habitat is in open country with bushes, trees, open brush and farms.
Chrosomus eos	Northern Redbelly Dace	Blue (2010)	NA	NA	Found in boggy lakes, ponds, beaver ponds, pools of headwaters and creeks, often in tea colored water over fine detritus or silt and usually near vegetation. Spawns among mats of filamentous algae or aquatic plants.
Contopus cooperi	Olive-sided Flycatcher	Blue (2009)	T (2010)	T (2007)	Most often associated with open areas containing tall live trees, or snags for perching. Open areas may be forest clearings, forest edges located near natural openings (such as rivers or swamps) or human made openings (such as logged areas), burned forest or openings within old growth forest stands. Generally, forest habitat is either coniferous or mixed wood. In the boreal forest, suitable habitat is more likely to be in or near wetland areas.
Coregonus artedi	Cisco	Red (2010)	NA	NA	Open bodies of lakes and large rivers, coastal waters of Hudson Bay. Moves into deeper water, to just below thermocline, in summer. Sometimes in large rivers. Often spawns in shallow water (1-3 m) over gravel or stony substrate but also may spawn pelagically in midwater. Eggs usually deposited on bottom.
Coregonus sardinella	Arctic Cisco	Red (2010)	NA	NA	Near river mouths and brackish lagoons. Leaves sea or estuary in spring and summer, ascends freshwater rivers to spawn, returns to sea after spawning. Young probably descend rivers to estuaries after hatching. Spawns over gravel in fairly swift water, eggs broadcast and abandoned.
Coregonus sardinella	Least Cisco	Blue (2010)	NA	NA	Non-migratory populations occur in large lakes and rivers. Anadromous populations inhabit Arctic coastal waters, estuaries and rivers. After hatching, young of anadromous populations move downstream to deeper slower water. Spawns in shallows of rivers or along lakeshores over bottom of gravel and/or sand. Eggs sink to bottom and lodge in crevices in gravel, and remain there until hatching in spring.

Environmental Effects Evaluation (EEE) Report

Scientific Name	Common Name	BC Endangered Species and Ecosystems	SARA Schedule 1	COSEWIC	Habitat Description and Comments
<i>Coturnicops noveboracensis</i>	Yellow Rail	Red (2010)	SC (2003)	SC (2009)	Found in grassy fresh water marshes and meadows.
<i>Enallagma hageni</i>	Hagen's Bluet	Blue (2004)	NA	NA	Ponds and marshes, prefers acidic water.
<i>Erebia pawloskii</i>	Yellow-dotted Alpine	Red (2013)	NA	NA	Wet tundra, small marshes or wet meadows often with shrub willows in or slightly below alpine zone; also, taiga and grassy openings in pine forests. Hosts in family Poaceae. The population in Stone Mountain Provincial Park is within the subalpine and alpine meadows, grassy areas and bogs (Guppy and Shepard 2001).
<i>Euphagus carolinus</i>	Rusty Blackbird	Blue (2010)	SC (2006)	SC (2009)	Nests in the boreal forests and favours the shores of wetlands, such as slow moving streams, peat bogs, marshes, swamps, beaver ponds and pasture edges. In the wooded areas it only rarely enters the forest interior. During the winter it mainly frequents damp forests and, to a lesser extent, cultivated fields. In Canada, the conversion of wetlands into farmland or land suitable for human habitation is the primary cause of habitat loss, particularly in their wintering habitat.
<i>Falco rusticolus</i>	Gyrfalcon	Blue (2010)	NA	NAR (1987)	Open mountain areas.
<i>Gulo gulo luscus</i>	Wolverine Luscus subspecies	Blue (2010)	NA	SC (2014)	Alpine and Arctic tundra, boreal and mountain forests (primarily coniferous). Limited to mountains in the south, especially large wilderness areas. Usually in areas with snow on the ground in winter. Riparian habitats may be important wintering habitat.
<i>Hiodon alosoides</i>	Goldeye	Blue (2010)	NA	NA	Often in quiet turbid water of medium to large lowland rivers, the small lakes, ponds, and marshes connected to them, and muddy shallows of larger lakes. Overwinters in deep water. Prefers moderate to fast current in Illinois and Ohio. Spawns in shallow firm-bottomed sites in river pools or backwaters or over gravel shoals in tributary streams. Eggs are semi-buoyant and drift downstream or into quiet water (Page and Burr 1991).
<i>Hirundo rustica</i>	Barn Swallow	Blue (2009)		T (2011)	Habitat is open or semi-wooded country, farms, ranches, fields, marshes, lakes, usually near habitation.
<i>Ischnura damula</i>	Plains Forktail	Red (2004)	NA	NA	Ponds with dense vegetation.
<i>Lasiurus borealis</i>	Eastern Red Bat	Red (2013)	NA	NA	Eastern Red Bats prefer to dwell in the forests and, for the most part, they are creatures that enjoy solitude. They are a primarily solitary species of bats. Unlike most other species in North America they will roost either out in the open or up in trees. Although most bats enjoy the occasional cave or tunnel, the Eastern Red Bat usually do not even consider them as a possible roosting site. They greatly prefer trees, especially the foliage.
<i>Limnodromus griseus</i>	Short-billed Dowitcher	Blue (2011)	NA	NA	Habitat is in mudflats, open marshes and ponds.
<i>Lycaena hyllus</i>	Bronze Copper	Blue (2013)	NA	NA	Marshes, sedge meadows, moist to wet grassy meadows, ditches, fens, streamside or pond-shore wetlands, or roads and right of ways through marshlands.
<i>Margariscus nachtriebi</i>	Pearl Dace	Blue (2010)	NA	NA	"Cool, clear headwater streams in the south, bog drainage streams, ponds and small lakes in the north, and in stained, peaty waters of beaver ponds" (Scott and Crossman 1973). Usually over sand or gravel (Page and Burr 1991). Spawns in

Environmental Effects Evaluation (EEE) Report

Scientific Name	Common Name	BC Endangered Species and Ecosystems	SARA Schedule 1	COSEWIC	Habitat Description and Comments
					clear water over sand or gravel in weak or moderate current (Scott and Crossman 1973).
Melanitta perspicillata	Surf Scoter	Blue (2005)	NA	NA	Summer habitat is fresh lakes and tundra.
Notropis hudsonius	Spottail Shiner	Red (2010)	NA	NA	Western populations: more closely restricted to large rivers and lakes, usually over sandy or rocky shallows with scant vegetation (Lee et al. 1980). Spawns in aggregations over areas of gravelly riffles near mouths of brooks, or along sandy shoals of lakeshores (Becker 1983).
Oncorhynchus clarkia lewisi	Cutthroat Trout, lewisi subspecies	Blue (2004)	SC (2010)	SC (2010)	Cutthroat trout usually inhabit and spawn in small to moderately large, clear, well-oxygenated, shallow rivers with gravel bottoms. They also reproduce in clear, cold, moderately deep lakes. They are native to the alluvial or freestone streams that are typical tributaries of the rivers of the Pacific basin, Great Basin and Rocky Mountains.
Oeneis philipi	Philip's Arctic	Red (2013)	NA	NA	Open spruce bogs (Layberry et al. 1998; Ople, 1998).
Oporornis agilis	Connecticut Warbler	Blue (2013)	NA	NA	Habitat is poplar bluffs, muskeg, mixed woods near water.
Papilio machaon pikei	Old World Swallowtail, pikei subspecies	Red (2013)	NA	NA	It frequents alpine meadows and hillsides, and males are fond of 'hilltopping', congregating near summits to compete for passing females. At lower elevations, it can be seen visiting gardens.
Pekania pennanti	Fisher	Blue (2006)	NA	NA	Fishers inhabit upland and lowland forests, including coniferous, mixed, and deciduous forests. They occur primarily in dense coniferous or mixed forests, including early successional forest with dense overhead cover (Thomas et al. 1993). Fishers commonly use hardwood stands in summer but prefer coniferous or mixed forests in winter. They generally avoid areas with little forest cover or significant human disturbance and conversely prefer large areas of contiguous interior forest. Riparian areas may be important to fishers because they provide important rest site elements, such as broken tops, snags, and coarse woody debris.
Physella wrighti	Hotwater Physa	Red (2008)	E (2003)	E (2008)	It occurs in habitat that maintains water temperature of 23-30 degrees C year round and occupies substrates near a water/air interface in areas of little or no water flow where the snails can position themselves and their eggs at temperatures optimal for life history requirements (COSEWIC, 2008).
Planorbula armigera	Thicklip Rmas-horn	Blue (2008)	NA	NA	It is usually found in flowing, but sluggish water.
Plebejus optilete	Cranberry Blue	Blue (2013)	NA	NA	Mostly boggy taiga, spruce bogs, and wet tundra.
Rangifer tarandus pop.14	Caribou (boreal population)	Red (2010)	T (2003)	T (2014)	In winter use mature and old growth coniferous forest that contain large quantities of terrestrial and arboreal lichens. These forests are generally associated with marshes, bogs, lakes, and rivers. In summer, the caribou occasionally feed in young stands, after fire or burning. Many subpopulations of Woodland Caribou Boreal populations show a preference for peatlands; they generally avoid clear cuts, shrub rich habitat, and aspen-poplar dominated sites.
Recurvirostra americana	American Avocet	Blue (2012)	NA	NA	Marshes, mudflats, alkaline lakes and ponds.
Salvelinus confluentus	Bull Trout	Blue (2011)		SC (2012)	Bottom of deep pools in cold rivers and large tributary streams, often in moderate to fast currents with temperatures of 45-50 F; also large coldwater lakes and reservoirs. Migratory forms live in

Environmental Effects Evaluation (EEE) Report

Scientific Name	Common Name	BC Endangered Species and Ecosystems	SARA Schedule 1	COSEWIC	Habitat Description and Comments
					tributary streams for up to several years before migrating downstream into a larger river or lake, where they spend several years before returning to tributaries to spawn (Rieman and McIntyre 1993). In lakes, inhabits all depths in fall, winter, and spring; moves to cooler, deeper water for summer. Usually spawns in gravel riffles of small tributary streams, including lake inlet streams. Spawning sites often are associated with springs (Rieman and McIntyre 1993).
<i>Setophaga castanea</i>	Bay-breasted Warbler	Red (2010)	NA	NA	Coniferous forests.
<i>Setophaga tigrina</i>	Cape May Warbler	Red (2010)	NA	NA	Habitat is in spruce forests – in migration any forested areas.
<i>Setophaga virens</i>	Black-throated Green Warbler	Blue (2010)	NA	NA	Conifer forests.
<i>Stenodus leucichthys</i>	Inconnu	Blue (2010)	NA	NA	Anadromous in coastal areas; ascends streams from the sea to spawn. Also in inland lakes, from which it migrates up tributary streams in summer, returning to lake in fall. Spawns in clear, fairly swift streams over bottoms of gravel and sand in water 1-3 m deep. Eggs sink to bottom and lodge in gravel.
<i>Ursus arctos</i>	Grizzly Bear	Blue (2010)	NA	SC (2002)	In British Columbia, grizzly bears inhabit approximately 90% of their original territory. There were approximately 25,000 grizzly bears in British Columbia when the European settlers arrived. However, population size has since significantly decreased due to hunting and habitat loss. In 2008, it was estimated there were 16,014 grizzly bears. Population estimates for British Columbia are based on hair-snagging, DNA-based inventories, mark-recapture, and a refined multiple regression model.

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, 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)). Since the proposed upgrade of the target segment of the highway will not involve more than two lanes of paved highway and is only 13 km long, there is no EAO requirement 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,

Environmental Effects Evaluation (EEE) Report

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;
- 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

Environmental Effects Evaluation (EEE) Report

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.

This work is to be constructed within the right-of-way boundaries of the Alaska Highway and as such, is not subject to permitting under Section 9 of the Water Act. Provincial guidelines will be followed where applicable, where federal guidelines/regulations are not available, or where species of special concern may be impacted. Provincial guidelines tend to be more specific in definition as opposed to federal guidelines which are often more general in nature. In this respect, it is advisable to use the most stringent and/or most applicable guidelines of the two authorities. As mentioned above, notification of this work was sent into the Fort St John office of MOE.

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>.

The Peace Region Least Risk Timing Windows - Biological Rationale

This 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

Environmental Effects Evaluation (EEE) Report

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.

BC Endangered Species and Ecosystems

Red List

Includes any ecological community, and indigenous species and subspecies that is extirpated, endangered, or threatened in British Columbia. Extirpated elements no longer exist in the wild in British Columbia, but do occur elsewhere. Endangered elements are facing imminent extirpation or extinction. Threatened elements are likely to become endangered if limiting factors are not reversed. Red-listed species and sub-species may be legally designated as, or maybe considered candidates for legal designation as Extirpated, Endangered or Threatened under the *Wildlife Act* (see <http://www.env.gov.bc.ca/wld/faq.htm#2>). Not all Red-listed taxa will necessarily become formally designated. Placing taxa on these lists flags them as being at risk and requiring investigation.

Blue List

Includes any ecological community, and indigenous species and subspecies considered to be of special concern (formerly vulnerable) in British Columbia. Elements are of special concern because of characteristics that make them particularly sensitive to human activities or natural events. Blue-listed elements are at risk, but are not Extirpated, Endangered or Threatened.

The RED and BLUE lists serve two purposes:

- To provide a list of species for consideration for more formal designation as Endangered or Threatened, either provincially under the British Columbia Wildlife Act, or nationally by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC).
- To help inform setting conservation priorities for species/ecological communities considered at risk in British Columbia.*

The rankings highlight species and ecological communities that have particular threats, declining population trends, or restricted distributions that indicate that they require special attention. These lists serve as a practical method to assist in making conservation and land-use decisions and prioritize research, inventory, management, and protection activities. For example, Operational Planning Regulations in the Forest Practices Code of British Columbia Act use the Red and Blue lists in the development of the list of Identified Wildlife.

*The [Conservation Framework](http://www.env.gov.bc.ca/conservationframework/) is British Columbia's new approach to setting priorities and actions for species and ecosystems of conservation concern. For more information see the [Conservation Framework](http://www.env.gov.bc.ca/conservationframework/) website at <http://www.env.gov.bc.ca/conservationframework/>.

The above list (under Federal – SARA) includes information for the provincial red/blue listed species in the Northeast Region within the BWBS and SWB zones. Information for COSEWIC (Committee on the Status of Endangered Wildlife in Canada) and SARA (Species at Risk Act) is also included where applicable. It is expected that these culvert works will have no effect on any of the listed species.

BC Parks

The park is situated at Kilometer 681 on the Alaska Highway, west of Fort Nelson. The 88 420 ha park surrounds Muncho Lake, a beautiful turquoise glacier-fed lake. The lake is the largest freshwater lake in the

Environmental Effects Evaluation (EEE) Report

Northern Rockies. Set in the Northern Rocky Mountains, Muncho Lake Park is located within the Muskwa-Kechika Management Area. The surrounding region is rural, with Toad River being the nearest community.

Primary Role

The primary role of Muncho Lake Park is to protect representative forest, lake and wetland ecosystems of the Eastern Muskwa Ranges Ecoregion and to a lesser extent, the Muskwa Foothills Ecoregion. Muncho Lake Park is the third largest contributor to the representation of the Eastern Muskwa Ranges Ecoregion, behind Northern Rocky Mountains and Dune Za Keyih parks. Three biogeoclimatic subzones are featured in the park, the AT unp, the BWBS mw2 and the SWB mk.

Zoning

Three zones have been identified for Muncho Lake. The Intensive Recreation Zone is located around nodes of activity along the Alaska Highway. This zone includes the two campgrounds, with a focus on ease of access, a high level of development, and a high amount of use. The level of current facility development in the Intensive Recreation Zone is not expected to occur beyond the boundaries of the Intensive Recreation Zone. This zone accounts for less than 0.2% of the park.

The Natural Environment Zone (approximately 80% of the park) is located from the south west to the north of the park. This zone designation provides for backcountry recreation opportunities with relatively open access for motorized vehicles.

The Wilderness Recreation Zone (approximately 20% of the park) extends from Nonda Creek south and is located in the southeast portion of the park. This area will be subject to greater access limitations, including reduced motorized use by ATVs. However, snowmobiles will continue to be an acceptable use, monitored closely. Non-consumptive backcountry recreational activities are acceptable in this zone.

British Columbia Ministry of Environment, Parks and Protected Areas Branch, BC Parks:

The Area Supervisor for Parks and Protected Areas in Fort Nelson, Al Hanson, was contacted to determine whether or not the project would encroach upon either Muncho Lake Provincial Park immediately south of the project area, or the Liard Corridor Provincial Park immediately north of the project area. It was determined that, since the proposed project activities will take place north of the Prochniak Creek Bridge, which actually represents the northern boundary of Muncho Lake Provincial Park, encroachment on that park is not anticipated. Additionally, since the northern extent of proposed project activities is approximately 12 km south of the Liard River Bridge, which represents part of the southern boundary of the Liard Corridor Provincial Park, encroachment on this park is also not anticipated. As project-related work is not being carried out in a Provincial Park, further provincial consultation was not deemed to be necessary. Copies of all correspondence are included in Appendix C.

PART C: SCOPE OF EVALUATION

C.1 Environmental Setting

This area is within a remote location of the highway with the nearest community being Muncho Lake to the south at KM 707 and Toad River at KM 649.

C.2 Physical Environment

Ecoregion Information

The proposed highway construction activities will be undertaken along a 13 km section of the Alaska Highway right of way, from Km 737 – Km 750. Stripping and excavation activities will be undertaken on an existing back slope cut within the highway right-of-way at Km 746.5. These areas reside within the Liard Basin ecoregion of the Boreal Cordillera Ecozone. This ecoregion encompasses a small portion of north central British Columbia and an extreme south eastern portion of the Yukon. The ecoregion is composed of a broad, rolling, low-lying area mantled with glacial drift and outwash deposits in which the Liard River is entrenched.

Climate and Weather

The region is subject to typical weather patterns of northern British Columbia, with precipitation averaging approximately 350 to 450 mm per year. The typical mean annual temperature for the area is approximately -3°C with a summer mean of 11°C and a winter mean of -18.5°C. The winters are very cold, thus requiring that construction be carried out during the spring and summer.

Geology

The Liard Basin ecoregion is underlain by Carboniferous Palaeozoic limestone and Cretaceous shale and lies at an elevation of 620–930 m asl. Luvisolic soils are associated with the productive upland boreal forests of the region. Cumulic Regosols support productive stands of white spruce along the floodplain of the Liard River and its larger tributaries. Eutric and Dystric Brunisols exist on coarse-textured fluvio-glacial deposits. Permafrost is scattered, confined mainly to lower north-facing slopes and sphagnum bogs.

The proposed project area is located within the Liard River drainage, which encompasses the Liard Plain and the Liard Plateau. Sedimentary rocks ranging in age from Devonian to Triassic underlie the plateau. A low area of slight relief lying within the Liard River drainage characterizes the Liard Plain. Topography in the area is characterized by a large hill north of the highway at Km 834, which reaches an elevation of approximately 2900 feet at its highest point.

C.3 Biological Environment

Vegetation

The Liard River drainage is located within the Boreal White and Black Spruce biogeoclimatic zone. Over flattened areas of topography, the landscape is covered with a mixture of black spruce bogs, white spruce and trembling aspen stands (Forest Cover Map, 1997). White spruce is common throughout the project area and black spruce is located primarily in muskeg swamps. Lodgepole pine is located on well-drained topography, and moist sites have black spruce and larch with Labrador tea, horsetail, and moss.

Mammals

The region surrounding the subject site is home to a large and varied animal population including moose, mule deer, elk, black bear, wood bison, wolf, beaver, muskrat, and snowshoe hare.

Environmental Effects Evaluation (EEE) Report

Birds

The Liard River valley also supports a waterfowl migration corridor, which runs from the Yukon to Alaska. Large numbers of duck, geese and swans utilize this corridor in the spring and fall, most within two kilometers of the Liard River.

Aquatic

A Fisheries Habitat Assessment was completed by Diversified Environmental Services for PWGSC in 1998, to assess fisheries habitat potential along the route of the highway for this project. Subsequently, Pottinger Gaherty Environmental Consultants Ltd. was retained to perform a *Fall 2000 Alaska Highway Fish and Fish Habitat Stream Inventory* and a *Spring and Fall 2001 Alaska Highway Fish and Fish Habitat Stream Inventory*. Upon completion, it was determined that, aside from Prochniak Creek and Trout River, two unnamed streams containing fish and fish habitat flow through the project area: one at km 740.6 and one at km 742.2. The fish known to use the waters in the first stream include Dolly Varden, bull trout and sculpin, while the fish present in the second stream have not been defined. A third stream, Ed's Creek, located at km 748.2, was surveyed for fish and fish habitat repeatedly; but was finally declared as a non-fish bearing stream due to barriers to migration downstream.

A small pond located 100 m left of the highway centreline at Km 743.075 and 743.2 is not expected to be impacted by project activities, given that the final highway centreline will be 60m away from its nearest edge, and that equipment involved in project-related activities in the vicinity of this area will maintain a distance of at least 30 m from the nearest edge of the pond.

Species at Risk

The distribution ranges for the species discussed below overlap with the project area, however, the likelihood that a particular species will be encountered at the subject site depends on its preferred habitat, whether that habitat exists at or near the project area, and the degree to which it avoids human activity. The preferred habitat and primary threats to survival are discussed for each species below, followed by a summary of the species most likely to occur at the subject site. Species listed federally under the *Species at Risk Act*, as being Endangered, Threatened or Special Concern, and species listed provincially under the *Wildlife Act*, as being Red or Blue-Listed, have been included in the chart under SARA on page 13 of this report.

The federal Species at Risk Act established Schedule 1 as the official wildlife species at risk list, and classifies species as extirpated, endangered, threatened, or of special concern. Once listed measures to protect and recover a listed species may be implemented. A species assessment undertaken by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) evaluates and makes the recommended status designation of the species. It may also be determined that insufficient information is known to classify a species or indicate whether it is currently at risk. The distribution ranges of the above species overlap with the project area, and considerations for limiting adverse effects on these species and their habitat resulting from project activities must be considered, given the size of the project area, the amount of potential habitat present, and the generally remote area of British Columbia that the highway accesses.

C.4 Socio-economic Environment

Muncho Lake community is located within the Muncho Lake Provincial Park. The park is located at the 650 Km mark of the Alaska Highway, 250 Km northwest of Fort Nelson. It has two separate campgrounds situated on the shores of Muncho Lake. Muncho Lake displays a perpetually blue hue, the result of copper oxides leached from the bedrock. Strawberry Flats Campground (15 vehicle/tent sites) is located at the south end of the lake, while MacDonald Campground (15 vehicle/tent sites) sits roughly at the midpoint of the 12 Km long lake. There are small beaches at each location. Roadside pullouts appear frequently with interpretive displays that provide details on wildlife, geological features and indicate hiking trails. A wide variety of wildlife is supported

Environmental Effects Evaluation (EEE) Report

in this park, which encompasses sub-alpine and alpine ecologies.

The community of Toad River is located at Km 649 and is the largest community in proximity to the proposed project. The community is the second-most populous in the Northern Rockies Regional Municipality, which encompasses the communities of Fort Nelson, Tetsa River, Toad River, the Fort Nelson & Prophet River First Nations, as well as many Alaska Highway Services Stops, including the Liard River Hotsprings. With a population of about 40 persons, Toad River is home to a highway maintenance camp, a small school, a Community Hall maintained by the Toad River Area Club (TRAC), two campgrounds, two lodges, and several guide-outfitting businesses. (NRRM Website, 2011)

Toad River is projected to grow over the next few years due in large part to the Toad River Electrification Project, completed in October 2009. The Toad River Land Use Policy has also been completed; this zoning policy gives guidance to future growth of the community and will pave the way for the Integrated Land Management Bureau (ILMB) to release additional lots in Toad River. (NRRM Website, 2011)

Sawlog forestry and mining are the main industrial land uses in the ecoregion. There is some recreational use of the major lakes and rivers in the ecoregion. Big game hunting, outfitting, and trapping are other uses of land in this region. Fort Nelson is the main community for services.

Cultural:

Hunting occurs in many areas in the vicinity of the Alaska Highway, and consists of both recreational and subsistence hunting. Kaska Dene natives hunt year round in the vicinity of Lower Post, located to the south of the existing highway at km 835. Trapping is a historically important activity in the Fort Nelson region. Recreation and tourism activities in the vicinity of the Alaska Highway are closely associated with wilderness pursuits. Major recreational activities include hunting, fishing and sightseeing.

Archaeological resources in the project area are expected to be minimal due to the past construction and current use of the highway. However, according to the Archaeological Impact Assessment of the Alaska Highway Reconstruction and Upgrading report that was produced by I.R. Wilson Consultants Ltd. in February 1998, the area between km 737 and km 762 has a medium to high archaeological potential. This is due to the proximity to a major river system and proximity to recorded archaeological sites. It should be noted that four archaeological sites were identified between km 737 and 762, but that these areas are completely outside the boundaries of the project area.

Heritage North Consulting Services conducted an archaeological assessment for selected areas proposed for realignment on the Alaska Highway between km 763 and 922 in 1997. The proposed route for highway construction and realignment between km 763 and 770 was identified as having very good archaeological potential. Upon completion of the assessment, a historic bridge feature, consisting of wooden planks containing iron spikes 50m south of the Mould Creek Crossing, was the only site determined to contain historical remnants, and no prehistoric remnants were encountered. The remains were assumed to have been associated with the original Alaska Highway bridge crossing of Mould Creek, dated to 1942. The proposed design does not encroach on this location, and the structure, therefore, is not endangered by construction and realignment activities.

Recreation and tourist activity in the vicinity of the Alaska Highway is closely associated with wilderness pursuits. Major recreational activities include hunting, fishing and sightseeing. The Liard Hotsprings, located at km 765, are the nearest recreational/tourist attraction to the project area. Muncho Lake Provincial Park, whose northern end is located at Prochniak Creek (km 737.4 of the existing Alaska Highway), is a popular camping and sightseeing location for locals and tourists, but is located outside of the project area.

Environmental Effects Evaluation (EEE) Report

C.5 Scoping

This environmental effects evaluation 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. The environmental effects of a project to be considered include at a minimum, but are not limited to those described under subsection 5(1) and 5(2) of CEAA 2012. The environmental effects considered under this report include the following in Table 1 *Potential Project/Environmental Interaction Matrix*.

Table 1: Potential Project / Environment Interactions Matrix

P = Potential Effect of Project on Environment; - = No Interaction

Project Phase / Physical Work/Activity	As per Section 5(1)			Section 5(1c)				Section 5(2)			Due Diligence		
	Fish and Fish Habitat (Fisheries Act)	Aquatic Species (SARA)	Birds (MBCA)	Health and Socio economic	Physical and cultural heritage	Land use	*HAPA Significance	Health and Socio economic	Physical and cultural heritage	HAPA Significance	Water (ground surface, drainage, etc.)	Birds / Wildlife	Soil
Construction													
Site Mobilization	-	-	-	-	-	-	-	-	-	-	-	P	-
Site Preparation for roadway (granular source clearing, grubbing, stripping and excavation activities etc.)	P	-	-	-	-	-	-	-	-	-	P	P	P
Culvert Installations	P	-	-	-	-	-	-	-	-	-	P	-	P
BST Surfacing	-	-	-	-	-	-	-	-	-	-	-	P	-
Site Demobilization	-	-	-	-	-	-	-	-	-	-	-	P	-
Operation and Maintenance													
Post Construction Highway Operations and Maintenance	-	-	-	-	-	-	-	-	-	-	-	-	-

*HAPA –structure, site or thing that is of historical, archaeological, paleontological or architectural significant

Table 2.1 – 2.4: Potential Project / Valued Ecosystem Interactions and Mitigation Measures (S.2(1))

Environmental Effects Evaluation (EEE) Report

Table 2.1 Valued Ecosystem Component - Fish (Fisheries Act)	
Potential Effect: <i>Harmful effects to fish and/or fish habitat.</i>	
Potential Interaction	Mitigation

Environmental Effects Evaluation (EEE) Report

Fish salvage may result in negative impacts on fish and fish health.

Project activities may result in debris/material entering a nearby freshwater environment.

Contamination of surface water from temporarily stored material during soil remediation activities.

Impacts to riparian areas from construction activities.

- complete a fish salvage before the start of works if any portion of the wetted channel will be isolated or dewatered. An appropriately qualified professional must complete the salvage. It is the responsibility of the salvage crew to obtain the necessary permits required by BC Wildlife Act and Canada Fisheries Act before conducting salvage activities (See MOE Application to Collect Fish for Scientific Purpose and the DFO Application for a Licence to Fish for Scientific, Experimental, Educational or Public display Purposes, Under Section 52 of the Fishery (General) Regulations). Chose low impact salvage methods such as trapping and seining before opting for higher impact methods such as electrofishing.
- use special techniques and extra caution when completing salvages that might involve species at risk. If species at risk are expected to be present, contact the regional MOE office or Environment Canada's website (www.sararegistry.gc.ca) for information regarding assessment and salvage requirements for species at risk.
- 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, (e.g., plastic, food scraps, etc.) enter the aquatic environments they must be removed immediately and disposed in a provincially approved manner.
- Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) 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.
- Machinery must be checked for leakage of lubricants or fuel and must be in good working order. Refueling must be done at least 30 m from any water body and on an impermeable surface. Basic petroleum spill clean-up equipment must be on-site. All spills or leaks must be promptly contained, cleaned up and reported to the 24-hour environmental emergencies reporting system. Spills must be immediately reported to the PWGSC departmental representative as soon as possible.
- where possible minimize the riparian area and/or watercourse disturbed by access activities along the adjacent upland property, and preserve trees, shrubs and grasses near the shoreline by using existing trails, roads or cut lines as access routes.
- limit machinery and equipment access and direct disturbance to streambank areas to prevent Harmful Alteration, Disruption or Destruction (HADD) to fish habitat.
- Consider other options when contemplating the need to remove riparian vegetation, as it is very often not the best choice and may cause Harmful Alteration, Disruption or Destruction (HADD) to fish and wildlife habitat and species. If vegetation removal is unavoidable, avoid grubbing and use vegetative maintenance and removal techniques such as pruning, mowing, girdding, topping and select tree removals that allow the root system to remain intact, to help bind the soils and encourage rapid colonization of low-growing plant species.

Environmental Effects Evaluation (EEE) Report

Magnitude	Reversibility	Geographic Extent	Duration	Frequency
<i>Small</i>	<i>Reversible</i>	<i>Immediate</i>	<i>Short-term</i>	<i>Once</i>
Residual Effects:				
<i>Insignificant</i>				
Monitoring:				
<i>An environmental monitor will be at site during any instream works (e.g. site isolation and re-introduction of water through new culvert.</i>				
Comments: <i>Sedimentation and waste material generated during construction activities has the potential to negatively impact adjacent waters and fish/fish habitat for the long-term. Such effects can be avoided through the application of effective mitigation measures. These measures will be part of the contractor's EP. Times that the environmental monitor will be at site should also be listed in this document.</i>				

Environmental Effects Evaluation (EEE) Report

Table 2.2 Valued Ecosystem Component – Water (ground, surface, drainage etc.)

Potential Effect: Surface water contamination.	
Potential Interaction	Mitigation
<p><i>Impacts to surface water through the introduction of sediments or contaminants.</i></p>	<ul style="list-style-type: none"> - <i>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.</i> · <i>If any construction debris/material, (e.g., plastic, food scraps, etc.) enter the aquatic environments they must be removed immediately and disposed in a provincially approved manner.</i> · <i>Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) 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.</i> · <i>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.</i> - <i>where possible minimize the riparian area and/or watercourse disturbed by access activities along the adjacent upland property, and preserve trees, shrubs and grasses near the shoreline by using existing trails, roads or cut lines as access routes.</i> · <i>Machinery must be checked for leakage of lubricants or fuel and must be in good working order. Refueling must be done at least 30 m from any water body and on an impermeable surface. Basic petroleum spill clean-up equipment must be on-site. All spills or leaks must be promptly contained, cleaned up and reported to the 24-hour environmental emergencies reporting system (1-800-565-1633).</i>
Magnitude	Geographic Extent
<i>Small</i>	<i>Immediate</i>
Reversibility	Duration
<i>Reversible</i>	<i>Short-term</i>
Residual Effects:	Frequency Significance
<i>Insignificant</i>	<i>Intermittent</i>
Monitoring:	
<p>Comments: <i>The potential exists for impacts to the surface water through the introduction of sediments or contaminants during work activities. These impacts can be eliminated or minimized through the use of federal and provincial best management practices, guidelines and regulations.</i></p>	

Environmental Effects Evaluation (EEE) Report

Table 2.3 Valued Ecosystem Component – Birds / Bird Habitat and Wildlife / Wildlife Habitat				
Potential Effect: Disturbance to wildlife and loss of bird habitat.				
Potential Interaction		Mitigation		
<p>Project activities may result in disturbance to wildlife / birds.</p> <p>Impacts on wildlife / birds due to vegetation clearing</p>		<ul style="list-style-type: none"> · Vegetation clearing must not take place during the bird breeding season until fledglings have left parental territories or unless a bird survey has been completed to ensure no nests are within the area proposed for clearing. · Proponents and Contractors must ensure that food scraps and garbage are not left at the project site. · Disturbances to all birds and wildlife in and near the project area must be avoided. · The Contractor must prevent hydrocarbon product releases in and around the project area. 		
Magnitude	Reversibility	Geographic Extent	Duration	Frequency
<i>Small</i>	<i>Reversible</i>	<i>Immediate</i>	<i>Short-term</i>	<i>Intermittent</i>
Residual Effects:				
<i>Insignificant</i>				
Monitoring:				
<i>A bird survey may be completed in areas that require tree removal.</i>				
<p>Comments: <i>The potential exists for the disturbance of wildlife and birds 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. Most of this section of highway was brushed 5 years ago and only those areas where the alignment has recently been altered will require clearing processes.</i></p>				

Environmental Effects Evaluation (EEE) Report

Table 2.4 Valued Ecosystem Component – Soil (Surface and Subsurface) Quality			
Potential Effect: Erosion and contamination of soils.			
Potential Interaction		Mitigation	
<p>Disturbance to soil from heavy equipment use.</p> <p>Increased soil disturbance within the area of work for the duration of the operation of the disposal site.</p> <p>Contamination of soil from temporarily stored material during soil remediation activities.</p>		<ul style="list-style-type: none"> · Contaminated soil that is in excess must be stored on site for the shortest time possible, covered, and be disposed of at an approved facility. · All contaminated soil remaining in place on site must be capped with clean fill, asphalt or concrete paving to ensure there is no access to contaminated soil. · Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) 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. · Machinery must be checked for leakage of lubricants or fuel and must be in good working order. Refueling must be done at least 30 m from any water body and on an impermeable surface. Basic petroleum spill clean-up equipment must be on-site. All spills or leaks must be promptly contained, cleaned up and reported to the 24-hour environmental emergencies reporting system (1-800-565-1633). · All waste materials must be disposed of according to provincial Waste Management Regulations. 	
Magnitude	Reversibility	Geographic Extent	Duration
<i>Small</i>	<i>Reversible/</i>	<i>Immediate</i>	<i>Short-term</i>
Residual Effects:			
<i>Insignificant</i>			
Monitoring:			
<i>None required</i>			
Comments:			
<i>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.</i>			

Environmental Effects Evaluation (EEE) Report

PART D: COMMUNICATIONS

D.1 Consideration of Public Concerns

The potential for public concern is minimal due to the remote location of the Alaska Highway and the fact that this is a fully operation and existing linear development. Public consultation was not deemed necessary as part of this screening. A record of public participation determination is found in **Appendix B**.

D.2 Aboriginal Interest

PWGSC evaluated this project to determine if the environmental effects will result in a significant adverse environmental effect upon aboriginal peoples.

D.3 Government Co-ordination

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

- Ministry of Natural Resources, BC – Water Act - Section 9 Notification
- Department of Fisheries and Oceans – prior involvement at the beginning of design phase. All DFO information and revisions were incorporated into the design.

As a result of this consultation, BC MOE and DFO provided expert advice that was considered and incorporated in the environmental effects evaluation.

Environmental Effects Evaluation (EEE) Report

PART E: ENVIRONMENTAL EFFECTS EVALUATION CONCLUSION

Potential impacts of this project are associated with fish and fish habitat, surface water, and birds/wildlife habitat. 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.

PART F: ACCURACY AND COMPLIANCE MONITORING

Site monitoring for this project should be completed during instream works. The contractor must provide a qualified professional to complete the isolation and fish salvage works required for the culverts. Sediment and erosion control will also require a site visit by a qualified professional to ensure compliance.

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: Rehabilitation of Km 737 to 750

PWGSC Project #: R.017173.055

Location: KM 737 to KM 750 of the Alaska Highway Corridor, Northeastern BC

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.

Environmental Effects Evaluation (EEE) Report

PART H: SIGNATURE

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, Environmental Services PWGSC Western Region

Date: _____

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, Lead Project Manager, AHP

Date: _____

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.

Environmental Effects Evaluation (EEE) Report

PART I: REFERENCES

Fisheries Protection Policy Statement (October 2013)

Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO)

Projects Near Water - Pathways of Effects (DFO)

Standards and Best Practices for Instream Works BC MOE (2004)

A User's Guide for Working In and Around Water BC MOE (2005)

EBA Tetrattech Highway Design KM737-750

APPENDIX A
FIGURES

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>there is an existing or likely public interest in the type, location or potential effects of the project?</i>		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<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	<input checked="" type="checkbox"/> No
<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	<input checked="" type="checkbox"/> No
<i>the project may be <u>perceived</u> as having the potential for significant adverse environmental effects?¹</i>		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>there is potential to learn from community ecological? knowledge or Aboriginal traditional knowledge?</i>		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>there is uncertainty about potential direct and indirect environmental effects or the significance of identified effects?</i>		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>the project has been or will be subject to other public participation processes that would meet the objectives of the Ministerial Guideline http://www.ceaa.gc.ca/013/006/ministerial_guideline_e.htm</i>		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
<i>there is any other reason why public participation is or is not appropriate?</i>		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

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

Yes

No

Additional comments to support determination:

This is an already existing linear development that is to be realigned to meet current code.

¹ 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)) – 5.(1) For the purposes of this 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;

(b) a change that may be caused to the environment that would occur:

- (i) on federal lands,
 - (ii) in a province other than the one in which the act or thing is done or where the physical activity, the designated project or the project is being carried out, or
 - (iii) outside Canada; and
- (c) with respect to aboriginal peoples, an effect occurring in Canada of any change that may be caused to the environment on
- (i) health and socio-economic conditions,
 - (ii) physical and cultural heritage,
 - (iii) the current use of lands and resources for traditional purposes, or
 - (iv) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

(2) However, 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 power or performance of a duty or function 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, or
 - (iii) any structure, site or thing that is of historical, archaeological, paleontological or architectural significance.

Schedule 2 (3) The Governor in Council may, by order, amend Schedule 2 to add or remove a compo-

ment of the environment.

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 cause 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) - 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.

Magnitude	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
Reversibility	Reversible	Effect can be reversed
	Irreversible	Effects are permanent
Geographic Extent	Immediate	Confined to project site
	Local	Effects beyond immediate project site but not regional in scale
	Regional	Effects on a wide scale
Duration	Short Term	Between 0 and 6 months in duration
	Medium Term	Between 6 months and 2 years
	Long Term	Beyond 2 years
Frequency	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	Mitigation Measures	Phase	Responsibility
Responsible environmental management	1.1	Design the project in an environmental responsible manner and employ the best management practices where required, complying with federal, provincial and municipal guidelines where applicable.	Pre-construction	PWGSC
	1.2	Ensure that required permitting, approvals and authorizations are in place prior to proceeding with construction	Pre-construction	PWGSC/ Contractor
	1.3	Contractor will be required to produce an environmental protection plan (EPP) that is written by a qualified professional. The EPP will provide the contractor and on-site workers with procedures and requirements for meeting permits, approvals, and authorization and for carrying out on-site activities using accepted BMPs. The EPP will be updated as required for this work.	Pre-Construction	Contractor
	1.4	Provide relevant federal and provincial agencies with final design plans for the work.	Pre-Construction	PWGSC
Aquatic Resources/Water Resources	2.1	Ensure debris and/or hydrocarbons do not enter into the water courses. Ensure all permitting, approvals and authorizations are in place prior to proceeding with any activities that may impact aquatic resources (i.e. permitting for fish salvage). Ensure that best management practices are employed where required complying with federal and provincial guidelines (i.e. Fisheries Protection Policy Statement (October 2013) Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO), Projects Near Water - Pathways of Effects (DFO), Standards and Best Practices for Instream Works BC MOE (2004), A User's Guide for Working In and Around Water BC MOE (2005))	Construction	Contractor/ PWGSC
	3.1	Vegetation clearing must not take place during the bird breeding season until fledglings have left parental territories or unless a bird survey has been completed to ensure no nests are within the area proposed for clearing.	Pre-construction	PWGSC/ Contractor
Birds and Wildlife	3.2	PWGSC and contractors must ensure that food scraps and garbage are not left at the project site.	Construction	PWGSC/ 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 of the work.

Mitigation

- *Complete a fish salvage before the start of works if any portion of the wetted channel will be isolated or dewatered. An appropriately qualified professional must complete the salvage. It is the responsibility of the salvage crew to obtain the necessary permits required by BC Wildlife Act and Canada Fisheries Act before conducting salvage activities (See MOE Application to Collect Fish for Scientific Purpose and the DFO Application for a Licence to Fish for Scientific, Experimental, Educational or Public display Purposes, Under Section 52 of the Fishery (General) Regulations). Chose low impact salvage methods such as trapping and seining before opting for higher impact methods such as electrofishing.*
- *Use special techniques and extra caution when completing salvages that might involve species at risk. If species at risk are expected to be present, contact the regional MOE office or Environment Canada's website (www.sararegistry.gc.ca) for information regarding assessment and salvage requirements for species at risk.*
- *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, (e.g., plastic, food scraps, etc.) enter the aquatic environments they must be removed immediately and disposed in a provincially approved manner.*
- *Work must be scheduled to avoid periods of heavy precipitation. Erosion control structures (temporary matting, geotextile filter fabric) 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.*
- *Machinery must be checked for leakage of lubricants or fuel and must be in good working order. Refueling must be done at least 30 m from any water body and on an impermeable surface. Basic petroleum spill clean-up equipment must be on-site. All spills or leaks must be promptly contained, cleaned up and reported to the 24-hour environmental emergencies reporting system. Spills must be immediately reported to the PWGSC departmental representative as soon as possible.*
- *Where possible minimize the riparian area and/or watercourse disturbed by access activities along the adjacent*

upland property, and preserve trees, shrubs and grasses near the shoreline by using existing trails, roads or cut lines as access routes.

- *Limit machinery and equipment access and direct disturbance to streambank areas to prevent Harmful Alteration, Disruption or Destruction (HADD) to fish habitat.*
- *Consider other options when contemplating the need to remove riparian vegetation, as it is very often not the best choice and may cause Harmful Alteration, Disruption or Destruction (HADD) to fish and wildlife habitat and species. If vegetation removal is unavoidable, avoid grubbing and use vegetative maintenance and removal techniques such as pruning, mowing, girdling, topping and select tree removals that allow the root system to remain intact, to help bind the soils and encourage rapid colonization of low-growing plant species.*
- *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.*

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