Environment Canada Environnement Canada

ENVIRONMENT CANADA'S

FINAL TECHNICAL SUBMISSION

RESPECTING THE

INUVIK TO TUKTOYAKTUK HIGHWAY, NWT

EIRB FILE NO. 02/10-05

Submitted to the
Environmental Impact Review Board
Inuvik, NT

October 29, 2012

Canada

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1.0 NON-TECHNICAL SUMMARY

The Hamlet of Tuktoyaktuk, Town of Inuvik and the Government of the Northwest Territories (the Proponent) are planning to construct a 140 km all-season highway to connect the Town of Inuvik to the Hamlet of Tuktoyaktuk (the Project). The highway would be comprised of a 2 lane gravel roadway with a footprint 20-28 m in width, and approximately 40 water crossings including 8 short-span single lane bridges and 32 culverts. Construction activities would include winter works to place fabric and fill over frozen land to protect permafrost, new quarry sites, temporary winter access roads along the route, temporary summer camps, and watercourse crossings.

This submission summarizes the outcomes of Environment Canada's (EC) analysis, consistent with Departmental mandate, of the Project Description and supporting information provided by the Proponent throughout the review process.

During EC's technical review of the Project, a number of issues were identified in areas of Departmental mandate that required focused discussion to resolve. Many of EC's requirements with regard to these issues will be satisfied through the implementation of the various approaches to mitigation outlined by the Proponent in Table F: Summary of Developer Commitments. These include the issues of; blast residue (EC Issue #1), erosion and sediment control (EC Issue #2), storage tank systems (EC Issue #3), spill reporting (EC Issue #4), spill contingency planning (EC Issue #5), incineration (EC Issue #6) and bird mortality due to vehicle collisions (EC Issue #11). In general, EC is satisfied with the Proponents proposed approaches to mitigation of potential impacts in these areas and has no further recommendations with respect to these issues.

The Developers commitments will also assist in addressing issues identified by EC related to migratory birds and species at risk. However, EC has provided further recommendations with respect to the issues of; the Proponents Wildlife Management Plan (EC Issue #7), wildlife monitoring reports (EC Issue #8), mitigation measures for migratory birds (EC Issue #9), indirect habitat loss for migratory birds (EC Issue #10) and cumulative effects assessment for species at risk (EC Issue #12). EC's recommendations in these areas generally flow from the review of new material provided by the Proponent following the completion of the Public Hearings. Some reflect outstanding concerns. Fully addressing these issues may require further commitments on the part of the Proponents and/or the identification of appropriate measures on the part of the Board as suggested in EC's recommendations.

Overall, EC was pleased with the Proponent's effort to work with the Department to address any outstanding concerns. EC would like to acknowledge the professional manner with which the Proponent and their consultants have conducted the review to date and the cooperative approach taken to work through outstanding issues.

EC is of the view that potential adverse effects of the Project can be mitigated or minimized through full implementation of the Proponent's commitments and the recommendations provided in this report.

2.0 ACRONYMS AND DEFINITIONS

ANFO……Ammonium Nitrate – Fuel Oil
CCME……Canadian Council of Ministers of the Environment
CEAA 1992……Canadian Environmental Assessment Act
CEPA……..Canadian Environmental Protection Act
CWS……..Canada-wide Standards
DFO……Department of Fisheries and Oceans
DOE Act……Department of the Environment Act
E2 Regulations.....Environmental Emergencies Regulations
EC……Environment Canada
EC-CWS……EC-Canadian Wildlife Service
EIRB……Environmental Impact Review Board
FA PPP……..Fisheries Act Pollution Prevention Provisions
GNWT……Government of the Northwest Territories
HWMP……Hazardous Waste Management Plan
IFA……..Inuvialuit Final Agreement
MBCA……...Migratory Birds Convention Act
MBR……Migratory Bird Regulations
PCDD…….. Polychlorinated dibenzo-p-dioxins
PCDF…….. ……...Polychlorinated dibenzofurans
SARA……..Species at Risk Act
WMP……..Wildlife Management Plan
ZOI……Zone of Influence

3.0 PARTY IDENTIFICATION

The following are the EC technical leads for this submission including names, technical qualifications, and full contact information:

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4.0 INTRODUCTION

Environment Canada (EC) is pleased to provide the following Technical Submission to the Environmental Impact Review Board (EIRB) for consideration regarding the Tuktoyaktuk to Inuvik Highway (the Project) proposed by the Hamlet of Tuktoyaktuk, Town of Inuvik and the Government of the Northwest Territories (the Proponent).

The Project as outlined in the Project Description includes a 140 km all-season highway to connect the Town of Inuvik to the Hamlet of Tuktoyaktuk. The highway would be comprised of a 2 lane gravel roadway with a footprint 20-28 m in width and approximately 40 water crossings including 8 short-span single lane bridges and 32 culverts. Construction activities would include winter works to place fabric and fill over frozen land to protect permafrost, new quarry sites, temporary winter access roads along the route, temporary summer camps, and watercourse crossings.

This submission summarizes the outcomes of EC's analysis, consistent with Departmental mandate, of the Project Description and supporting information provided by the Proponent throughout the review process.

EC based its analysis on the principle that the Project, if approved, should be planned, built, operated and maintained in a manner that ensures the highest level of environmental protection so that the well-being of Canadians is enhanced and the natural environment is conserved.

4.1 Mandate, Role and Responsibilities of Environment Canada

The mandate of EC is determined by its departmental statute, the *Department of the Environment Act* (DOE Act), and the legislation under the responsibility of the Minister of Environment. In delivering this mandate, the Department is responsible for the development and implementation of policies, guidelines, codes of practice, federal, territorial, and international agreements, and related programs. The overall objective is to foster harmony between society and the environment for the economic, social and cultural benefit of present and future generations of Canadians. The Department shares this goal with other federal agencies, provinces, territories and Aboriginal peoples.

The DOE Act provides EC with general responsibility for environmental management and protection. Its obligations extend to and include all matters over which Parliament has jurisdiction, which have not by law been assigned to any other department, board, or agency of the Government of Canada. The DOE Act delegates responsibility to the Minister for:

- preservation and enhancement of the quality of the natural environment (e.g. water, air, soil);
- renewable resources including migratory birds and other non-domestic flora and fauna;
- water;
- meteorology; and
- coordination of federal policies and programs respecting preservation and enhancement of the quality of the natural environment.

The DOE Act states that EC has a responsibility to advise other federal departments, boards and agencies on matters pertaining to the preservation and enhancement of the quality of the natural environment.

4.2 Scope of the Technical Submission

The Scope of this Technical Submission is limited to EC's review of the Project and subsequent provision of relevant specialist / expert information and knowledge in the following areas of Departmental mandate:

- Species at Risk, including species listed on Schedule 1 of the *Species at Risk Act* as well as those species under consideration for listing on Schedule 1;
- Migratory Birds, as defined in the *Migratory Birds Convention Act*;
- Waste Management, including incineration at work camps and Waste Management Planning;
- Cumulative Impacts, consistent with Section 16(1)(a) of the *Canadian Environmental Assessment Act*, 1992 (CEAA 1992); and
- Pollution Prevention including Emergencies and Spill Contingency Planning.

4.3 Environment Canada's Capacity in the Technical Submission

This submission is provided in EC's capacity as an expert advisor to the EIRB. EC will not be required to provide a licence, permit or any other authorization with respect to the Project as currently described. Thus, EC has limited its intervention to the provision of specialist / expert information and knowledge in the areas of Departmental mandate, relevant to the current Project, and in accordance with Sections 11 – Environmental Impact Screening and Review Process (specifically Section 11(32)) and 13 – Wildlife Impact Assessment (specifically Section 13(12)) of the Inuvialuit Final Agreement (IFA). EC recognizes and respects that this review is being conducted under a substituted process. However, the Department must continue to strive to meet obligations set out under paragraph 16(1) (a) of the CEAA 1992 and has done so with regard to this submission.

Of particular applicability to the current project proposal and binding on the Proponent, if the project proceeds, are the following legislation administered in whole or in part by Environment Canada:

- *Canadian Environmental Protection Act* (CEPA) and its Regulations
- *Fisheries Act* (i.e. Pollution Prevention Provisions)
- *Migratory Birds Convention Act* (MBCA) and its Regulations
- *Species at Risk Act* (SARA)

Please see Appendix A for a brief description of the above instruments.

5.0 ISSUES, COMMENTS AND RECOMMENDATIONS

EC Issue #1 – Blast Residue

Reference(s):

Environment Canada's Draft Technical Submission Respecting the Inuvik to Tuktoyaktuk Highway, NWT, September 10, 2012

Environment Canada's Information Request Responses, March 30, 2012, Table F: Summary of Developer Commitments with Environment Canada IR Responses

Table F: Summary of Developer Commitments, August 31, 2012

Response to Parties Technical Submissions for the Construction for the Inuvik to Tuktoyaktuk Highway, NWT, September 13, 2012

Proponent's Conclusion:

As recommended by EC, the Proponent will ensure that all construction contractors selected for the Project will use only emulsion-type, or more likely, stick-type explosives for blasting activities that may be undertaken at any of the selected borrow sites. The contractor's Explosives Management Plan will outline the procedures for employing these explosives and include provisions to ensure that blast residue will not enter any water bodies.

Environment Canada's Conclusions:

EC's concern regarding blast residue will be satisfied through the Proponent ensuring the use of only emulsion-type (or stick-type) explosives for any blasting activities that may be undertaken at the selected borrow sites and the inclusion of provisions in their Explosives Management Plan to ensure that blast residue does not enter water bodies.

Environment Canada's Recommendations:

No further recommendations.

EC Issue #2 – Erosion and Sediment Control

Reference(s):

Environment Canada's Draft Technical Submission Respecting the Inuvik to Tuktoyaktuk Highway, NWT, September 10, 2012

Environment Canada's Information Request Responses, March 30, 2012, Table F: Summary of Developer Commitments with Environment Canada IR Responses

Response to Parties Technical Submissions for the Construction for the Inuvik to Tuktoyaktuk Highway, NWT, September 13, 2012

Proponent's Conclusion:

The Proponent has committed to developing and implementing an Erosion and Sediment Control Plan as part of their Environmental Management Plan. The proposed plan will comply with appropriate erosion and sediment control guidelines, GNWT best management practices, and measures outlined in the Department of Fisheries and Oceans (DFO) *Land Development Guidelines for the Protection of Aquatic Habitat* (1993).

The development of borrow pits will adhere to Aboriginal Affairs and Northern Development Canada's (AANDC) *Northern Land Use Guidelines for Pits and Quarries* (January 2010), which also includes relevant DFO operational statements for the protection of water resources.

All borrow sources are located within continuous permafrost, where zones of unfrozen ground at depth are not expected to be encountered. In addition, given the nature of the borrow sites, which typically consist of deposits of relatively porous aggregate material (sand, gravel, rocks / boulders), it would be expected that much of the seasonal melt water generated in the aggregate stockpiles would likely percolate directly into the shallow active layer that naturally develops each summer in the area. However, site drainage controls, including localized ditching / swales within the borrow sites and silt fencing will be employed as necessary to ensure that sediment contained in melt water from ground ice in the aggregate, or site runoff in general, are appropriately managed and are not released into the surrounding watershed.

Environment Canada's Conclusions:

EC's concern regarding soil, silt or sediment-laden water entering surface waters (including rivers, creeks, ditches, or other water bodies), which can adversely impact aquatic ecosystems, will be satisfied through the Proponent's development and implementation of an Erosion and Sediment Control Plan, adherence to the AANDC *Northern Land Use Guidelines for Pits and Quarries* (2010), and the application of drainage control measures as necessary.

Environment Canada's Recommendations:

No further recommendations.

EC Issue #3 – Storage Tank Systems

Reference(s):

Environment Canada's Draft Technical Submission Respecting the Inuvik to Tuktoyaktuk Highway, NWT, September 10, 2012

Environment Canada's Information Request Responses, March 30, 2012, Table F: Summary of Developer Commitments with Environment Canada IR Responses

Response to Parties Technical Submissions for the Construction for the Inuvik to Tuktoyaktuk Highway, NWT, September 13, 2012

Table F: Summary of Developer Commitments August 31, 2012

Proponent's Conclusion:

The Proponent has committed to ensure that all contractors selected for highway construction related activities (i.e. the Project) store fuel in double-walled fuel storage tanks, and in accordance with Canadian Council of Ministers of the Environment (CCME) guidelines and CEPA *Storage Tank System for Petroleum Products and Allied Petroleum Product Regulations* (Storage Tank Regulations).

Environment Canada's Conclusions:

The Proponent has committed to storing fuel in double-walled fuel storage tanks in accordance with the Storage Tank Regulations. However the Proponent has not committed to complying with other aspects of the regulations. EC would be happy to discuss the regulations with the Proponent to ensure that their tank systems comply with the regulation's design requirements. The CEPA *Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations* apply to both aboveground and underground storage tank systems (including the piping and other tank associated equipment) under federal jurisdiction containing petroleum and allied petroleum products that have a capacity greater than 230 litres. This includes tanks located on federal or Aboriginal lands. Exceptions are pressurized tanks, mobile tanks, tanks regulated by the National Energy Board, and outdoor, aboveground storage tank systems that have a total combined capacity of 2500 litres or less and are connected to a heating appliance or emergency generator. All storage tank system owners must identify their tank systems to EC and installation of new systems must comply with the regulation's design requirements. Further information on these regulations can be found at www.ec.gc.ca/st-rs.

Environment Canada's Recommendations:

EC expects that the Proponent will comply with all applicable regulations for fuel storage including the CEPA *Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations*.

EC Issue #4 – Spill Reporting

Reference(s)**:**

Environment Canada's Draft Technical Submission Respecting the Inuvik to Tuktoyaktuk Highway, NWT, September 10, 2012

Environment Canada's Information Request Responses, March 30, 2012, Table F: Summary of Developer Commitments with Environment Canada IR Response

Table F: Summary of Developer Commitments August 31, 2012

Proponent's Conclusion:

The Proponent's contractors will report all spills greater than 5 litres to the Government of the Northwest Territories Spill Line and other appropriate agencies. However, all spills of oil,

fuel, or other deleterious materials, regardless of size, are to be reported to the NU / NWT 24-hour Spill Line (867) 920-8130.

Environment Canada's Conclusions:

EC's concern regarding spill reporting is addressed by the Proponent's commitment to reporting all reportable spills regardless of quantity to the NU/NWT Spill line.

Environment Canada's Recommendations :

No further recommendations.

Issue #5 – Spill Contingency Plan

Reference(s)**:**

Environment Canada's Draft Technical Submission Respecting the Inuvik to Tuktoyaktuk Highway, NWT, September 10, 2012

Environment Canada's Information Request Responses, March 30, 2012, Table F: Summary of Developer Commitments with Environment Canada IR Responses

Response to Parties Technical Submissions for the Construction for the Inuvik to Tuktoyaktuk Highway, NWT, September 13, 2012

Table F: Summary of Developer Commitments August 31, 2012

Proponent's Conclusion:

The Proponent is committed to ensuring that spill contingency plans will be developed by its construction contractors and will be submitted to regulators for review as part of their Environmental Management Plan. The Proponent will also ensure that any Environmental Emergencies Regulations (E2) reporting requirements under CEPA are identified as applicable.

Environment Canada's Conclusions:

EC's concerns regarding the lack of a site specific spill plan and identification of E2 reporting requirements are satisfied, given the Proponent's commitment to provide a plan for review by regulators, and to ensure that the E2 reporting requirements, if applicable are identified.

Environment Canada's Recommendations:

No further recommendations.

Issue #6 – Incineration

Reference(s)**:**

Environment Canada's Draft Technical Submission Respecting the Inuvik to Tuktoyaktuk Highway, NWT, September 10, 2012

Environment Canada's Information Request Responses, March 30, 2012, Table F: Summary of Developer Commitments with Environment Canada IR Responses

Response to Parties Technical Submissions for the Construction for the Inuvik to Tuktoyaktuk Highway, NWT, September 13, 2012

Proponent's Conclusion:

The Proponent has advised EC that there is no plan, on the part of the contractors associated with the construction of the highway, to employ incineration as a method of waste management, and that they will develop a Waste Management Plan for all wastes associated with pre-construction and construction activities. The Waste Management Plan will apply to the Proponent and all associated Project contractors involved in the generation, treatment, transferring, receiving, and disposal of waste materials for the Project. The Proponent has committed to the following steps prior to disposal of waste: obtaining approval from the Town of Inuvik and Hamlet of Tuktoyaktuk to use their sewage lagoon and solid waste disposal facilities; providing an estimate of the amount and type of domestic waste generated by the Project compared to the facility's available capacity; following all applicable licenses, permits, and/or municipal bylaws regarding the use of the facilities in Inuvik and Tuktoyaktuk; and recording the amount of domestic waste shipped to the landfills.

Environment Canada's Conclusions:

EC's concerns regarding waste management, achieving the intent of the Canada-wide Standards for dioxins/furans and mercury, and reducing releases of other toxic substances are mitigated by the Proponent's commitments to develop a Waste Management Plan and submit this plan to regulators for review as part of their Environmental Management Plan, and to not use incineration as a method of waste management.

Environment Canada's Recommendations:

No further recommendations.

Issue #7 – Wildlife Management Plan

Reference(s)**:**

EC Information Request Responses Respecting the Inuvik to Tuktoyaktuk Highway, NWT, March 30, 2012, IR #123

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to the January 16, 2012 Information Requests, February 2012, IR #55 - Table F Summary of Developer Commitments

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Table F: Summary of Developer Commitments, August 31, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to Parties' Technical Submissions for Construction of the Inuvik to Tuktoyaktuk Highway, NWT, September 13, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Table F: Summary of Developer Commitments, September 28, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Draft Wildlife and Wildlife Habitat Protection Plan (WPP), October 05, 2012

Proponent's Conclusion:

The Proponent has committed to developing and implementing species specific Wildlife Management Plans (WMP) prior to construction. Section 4.2.7 of the EIS and the Proponent's updated commitments table (Table F, Sept. 28, 2012) outline the specific elements that are to be included in the WMPs. The Proponent submitted a draft Wildlife and Wildlife Habitat Protection Plan and Wildlife Effects Monitoring Program discussion draft in early October, 2012, which provides an annotated outline of the plan.

Environment Canada's Conclusions:

EC recommended the Proponent provide Wildlife Management Plans (WMP) prior to construction. The intent of this recommendation was so that EC and other interested parties would have the opportunity to review the plans and provide input prior to construction. Several of EC's comments pertaining to commitments made in the February 2012 version of Table F *Summary of Developer Commitments* have been addressed in the Proponent's updated Commitments Tables dated August 31 and September 28, 2012. EC recommendations that were addressed by the Developer's August 31 commitments to incorporate the following aspects into the WMPs include:

- A tracking system is needed to ensure that contractors are providing education and training to wildlife monitors employed during the construction phase.
- Critical time periods for different wildlife species should be specified in the Wildlife Management Plan.
- Provide recommended setbacks for different species or species groups. [*EC has recommended specific setbacks for different species groups of migratory birds in Issue #9 for inclusion in the Proponent's WMP*]
- Ensure that specifics of infrastructure design to limit wildlife attraction are outlined in the Wildlife Management Plan, as well as detection and deterrent strategies to be used for problem wildlife.
- Add EC to the list of agencies to be consulted in the development of the WMP.

The Proponent has since provided an additional commitment (Table F, September 28, 2012) to provide appropriate linkages to other mitigation plans for weed control, dust management and waste management. EC expects that this commitment will address our recommendations that the Proponent:

- Provide details on how equipment will be monitored for cleanliness (relates to introduction of invasive species).
- Provide details on how effectiveness of dust control will be monitored and how impacts to habitat and forage quality will be monitored in the WMP.
- Provide details of how waste management practices will be audited to ensure adherence to the Waste Management Plan.

The draft Wildlife and Wildlife Habitat Protection Plan (WPP) submitted by the Proponent is an annotated table of contents which applies to the Construction phase of the project. The Proponent has indicated that the preliminary draft will be further developed in consultation with EC, Inuvik and Tuktoyaktuk Hunters and Trappers Committees and the Wildlife Management Advisory Council (NT). The Proponent expects to complete the WPP prior to the release of the EIRB Panel's report of environmental Assessment.

EC is pleased to see that the Proponent has included the minimum setback distances for wildlife habitat and wildlife use areas recommended in the Northwest Territories Seismic Operations Guidelines in their draft WPP. EC notes, however, that the setbacks for blasting near bear dens provided in the section of the WPP dealing with Grizzly Bear are smaller than those recommended in the seismic guidelines (500 m vs. 1.5 km). The setbacks cited in this section of the document should be updated to be consistent with the seismic guidelines.

The draft Wildlife and Wildlife Habitat Protection Plan (WPP) is still very much a preliminary document at this time and further consultation is required to ensure it is developed to a level that is satisfactory to other parties before construction begins, should the project be approved.

Environment Canada's Recommendations:

EC recommends the EIRB direct the Proponent to provide an updated draft of the *Wildlife and Wildlife Habitat Protection Plan* (WPP) for further review by EC, other regulators and interested parties at least 60 days prior to construction, should the project proceed. The (WPP) should provide a detailed account of how all of the items indicated in the Wildlife and Wildlife Habitat section of the Proponent's September 28, 2012 Commitments Table will be implemented.

Issue #8 – Wildlife Monitoring Report

Reference(s)**:**

EC Information Request Responses Respecting the Inuvik to Tuktoyaktuk Highway, NWT, March 30, 2012, IR #123

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to the January 16, 2012 Information Requests, February, 2012, IR #55, Table F Summary of Developer Commitments

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories,Table F: Summary of Developer Commitments, August 31, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Table F: Summary of Developer Commitments, September 28, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Draft Wildlife and Wildlife Habitat Protection Plan (WPP) – October 05, 2012

Proponent's Conclusion:

The Proponent has committed to providing annual construction monitoring reports to regulators and other interested parties that will include the results of wildlife monitoring, conformance with management plans, dust control effectiveness and any adaptive management measures that were implemented.

Environment Canada's Conclusions:

EC recommended the following items be included in annual wildlife monitoring reports during our review of the Proponent's initial Commitments Table (Table F – IR#55):

- Results of pre-disturbance wildlife surveys should be included in annual monitoring reports; EC should be included as a recipient of such reports.
- Wildlife and habitat features such as dens or nests that are detected by wildlife monitors during pre-construction surveys or during construction activities should be documented and reported, including any mitigation measures used to reduce impacts and the effectiveness of those measures.
- Records should be kept of any wildlife notifications and included in monitoring reports. Observations of species at risk that occur outside of predetermined setbacks should also be noted and recorded by wildlife monitors and included in monitoring reports.
- Encounters and mortalities should be included in an annual monitoring report to be shared with regulators and other interested parties, including EC.

These recommendations have been included in the Proponent's updated Commitments Table dated August 31, 2012 and September 28, 2012.

The draft Wildlife and Wildlife Habitat Protection Plan (WPP) submitted by the Proponent also indicates that annual reviews of the WPP will be conducted with GNWT-ENR, EC and project wildlife monitors to discuss issues and adapt the Operations phase WPP if required. The annual review will also report on the adequacy of mitigations for SARA species and any adjustments made. The annual construction monitoring reports that the Proponent has committed to produce should assist EC and other parties in the annual review of the WPP.

Environment Canada's Recommendations:

EC recommends that:

- The EIRB direct the Proponent to provide annual construction monitoring reports for review by EC, other regulators and interested parties. Comments from reviewers should be used to amend the Wildlife and Wildlife Habitat Protection Plan (WPP) as deemed necessary.
- The EIRB direct the Proponent to submit wildlife monitoring reports to regulators and other wildlife co-management partners for any monitoring programs that extend into the operational phase of the project (e.g. those outlined in the draft WEMP).

Issue #9 – Mitigation Measures for Birds

Reference(s)**:**

Environment Canada's Information Request Responses Respecting the Inuvik to Tuktoyaktuk Highway, NWT March 30, 2012 IR #12

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to the January 16, 2012 Information Requests, February, 2012 IR #55, Table F Summary of Developer Commitment

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Table F: Summary of Developer Commitments, August 31, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Table F: Summary of Developer Commitments, September 28, 2012

Proponent's Conclusion:

The Proponent has committed to: conducting pre-disturbance nest surveys from May-September to document use by nesting birds; designing structures in a way that limits or prevents their potential use as nesting structures; and, allowing nesting birds who have utilized structures to remain in place.

Environment Canada's Conclusions:

Activities that physically disturb terrestrial habitat during the breeding season can result in the inadvertent disturbance or destruction of nests and eggs of migratory birds. This "incidental take" of migratory bird nests and eggs is prohibited under section 6(a) of the federal *Migratory Birds Regulations*. Under the legislation, Environment Canada cannot issue a permit to authorize the disturbance or destruction of a nest in circumstances of incidental take. As a result, the Proponent is responsible for implementing appropriate measures to ensure that they comply with the legislation and regulations and minimize risks to migratory birds.

EC generally recommends that project proponents avoid engaging in potentially destructive activities during the key migratory bird breeding period as primary mitigation to reduce the risk of nest destruction. In the southern Arctic region of the Northwest Territories and Nunavut, migratory birds may be found incubating eggs from May 14 until July 30, and

young birds can be present in the nest until September 12.

The Proponents's plan to carry out the majority of road construction activities during winter will help reduce the risk of incidental disturbance or destruction of nests or eggs of migratory birds. Summer activities may include placement of culverts and construction of bridges, and grading/compaction of sections of the embankment that were laid down in winter. The Proponent has indicated a number of commitments to avoid incidental disturbance or destruction of nests and eggs of migratory birds during work carried out in the summer breeding season. This includes conducting pre-disturbance surveys in areas of summer construction works and the use of pre-determined setback distances to protect key wildlife habitat features such as nests from disturbance. The Proponent also intends to notify GNWT-ENR and EC-CWS if key nesting features of a species at risk are discovered and to temporarily suspend activities within the area.

Environment Canada's Recommendations:

EC recommends :

- The Proponent consult the fact sheet "Planning Ahead to Reduce Risks to Migratory Bird Nests", available at: http://www.ec.gc.ca/paom-itmb/
- The Proponent minimize the amount of habitat disturbance that will take place during the migratory bird breeding season. Vegetation clearing necessary to install water crossings should be conducted outside of the migratory bird breeding season to the greatest extent possible.
- For areas that cannot be cleared or disturbed outside of the nesting season, areas should be thoroughly surveyed for active nests using a scientifically sound approach a maximum of 4 days before destruction/clearing. Surveys should be carried out by an avian biologist or naturalist with experience with migratory birds and migratory bird behaviour indicative of nesting (e.g. aggression or distraction behaviour; carrying nesting material or food
- The following setback distances are recommended for species at risk:

- Rusty Blackbird (Species of Special Concern, Schedule 1 of Species at Risk Act) – 300 m[1]
- Short-eared owl (Species of Special Concern, Schedule 1 of Species at Risk Act) – 1.5 km[1]
- Peregrine Falcon (anatum/tundrius Species of Special Concern, Schedule 1 of Species at Risk Act) – 1.5 k m[1]
- Horned Grebe (assessed by COSEWIC as a species of Special Concern) – 100 m from the high water mark of the wetland or water body containing a nest

[1] Based on setback distances recommended in Table 6 of: Aboriginal Affairs and Northern Development Canada. 2011. Northern Land Use Guidelines Volume 09a – Northwest Territories Seismic Operations. 47 pgs.

- The following setback distances should be used to protect different groups of tundra-nesting bird species should nests be encountered:

Species Group	Pedestrians /ATVs (m)	Roads / Construction / Industrial Activities (m)
Songbirds	30	100
Shorebirds	50[a]	100[a]
Terns/Gulls	200[b]	300[b]
Ducks	100	150
Geese	300	500
Swans/Loons/Cranes	500	750

[a] If project activities are within the breeding ranges of American Golden Plover or Ruddy Turnstone, these setbacks should be increased to 150 m for Pedestrians/ATVs and 300 m for Roads/Construction/Industrial Activities respectively. If project activities are within the breeding ranges of Black-bellied Plover, Whimbrel or Redknot (a Species at Risk), these setbacks should be increased to 300m for Pedestrians/ATVs and 500m for Roads/Construction/Industrial Activities. If field crew are trained in the identification of these species, then these higher setbacks need only apply to these more sensitive species, and lower setbacks can be used for the remaining shorebird species. In areas where several species are nesting in proximity, setbacks for the most sensitive species should be used if they are present.

[b] If project activities are in proximity to nests of Ross's Gull (Threatened – SARA Schedule 1) these setbacks should be increased to 500 m Pedestrians/ATVs and 750 m for Roads/Construction/Industrial Activities. The draft Recovery Strategy for Ivory Gull (Endangered – SARA Schedule 1) currently identifies the area within a 2-km radius around colonies where at least one individual was observed nesting any time between 2002 and 2009 as Critical Habitat. As a precautionary approach, a 2-km setback should also be applied to any Ivory Gull nest that is encountered in an area that is not currently identified as Critical Habitat in the Recovery Strategy.

- In cases where it is not feasible to use the recommended setback distances to protect a nest, nest-specific guidelines and procedures should be developed to protect the nest.
- Nests should be monitored to determine the success of mitigation measures and the results of monitoring should be provided in annual construction monitoring reports.

Issue #10 – Indirect Habitat Loss for Migratory Birds

Reference(s)**:**

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Environmental Impact Statement for the Construction of the Inuvik to Tuktoyaktuk Highway, NWT, May 2011, Sections 3.14 & 4.2.3.5

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to the March 8, 2012 Information Requests (Round 2), March 30, 2012, IR #115

Government of the Northwest Territories Department of Transportation and Department of Environment and Natural Resources, Wildlife Effects Monitoring Program (WEMP) – Discussion Draft, October, 2012

Proponent's Conclusion:

The Proponent identified noise and dust emissions from the road as sources of potential habitat degradation and disturbance leading to indirect habitat loss for wildlife along the highway corridor. The Proponent predicted that, during the construction phase, wildlife and birds would temporarily avoid areas with noise from construction and excavation; however, no residual effects were expected once the construction phase was complete. During operation of the Highway, the Proponent expected that the zone of influence from noise generated by passing vehicles would extend up to 400 to 1500 m from the road edge, representing 3.3% to 10% of the Regional Study Area. The Proponent predicted that operation of the Highway would influence bird behaviour and energy budgets, but that disturbance would be limited to only those birds immediately adjacent to the Highway and thus only a small fraction of the surrounding population would be affected. Based on expected traffic volumes of 150-200 vehicles per day, and the transitory, short-term nature of noise from passing vehicles, the Proponent concluded that impacts from noise during operation of the Highway would be negligible with no residual effects.

Environment Canada's Conclusions:

The majority of studies investigating road effects on wildlife have documented a negative effect of roads on animal abundance. For example, Fahrig and Rytwinski (2009) reviewed 79 studies of road impacts on wildlife and found that the number of documented negative effects of roads on animal abundance outnumbered positive effects by a factor of 5. Benítez-López et al. (2010) conducted a meta-analysis of road impacts on birds and mammals using data from 49 studies covering 234 mammal and bird species and found that the species abundance of birds generally declined between 28-36% within 2.6 km of roads, and mammal species abundance declined 25-38% within 17 km from infrastructure. It is therefore reasonable to expect that the abundance of birds may decrease in proximity to the road due to noise disturbance, visual disturbance or reduced quality of forage from deposition of dust. There are few studies of road impacts on birds in tundra environments, which would allow us to generalize about the distance over which road impacts may occur. Male and Nol (2005) did not find any evidence that Lapland Longspurs avoided nest sites near roads at the Ekati Diamond Mine, and nest success was similar at sites adjacent and far from the road. Similarly, Gebauer et al. (2012) also found that the abundance of Lapland Longspurs did not vary with distance from the all-weather public access road at the Meadowbank Mine. It should be noted that Lapland Longspurs appear to be relatively tolerant of human disturbance and both studies were limited to investigating road effects within the first 5 years of operations.

Visual disturbance may also influence the use of areas adjacent to the Highway by birds. There are few studies documenting the reaction of birds to passing vehicles on roadways, but there is some evidence to suggest that birds in areas adjacent to roadways may flush, swim away or interrupt feeding in response to passing vehicles, particularly when they are <100 m from a road (Pease et al. 2005).

EC agrees with the Proponent's assessment that dust deposition may affect vegetation up to 400 m from the Highway and that this in turn may affect the quality of wildlife habitat adjacent to the Highway. Male and Nol (2005) observed that dust deposition reduced moss cover near roads and recommended that studies be repeated every 5 years to assess whether dust effects were significant enough to negatively affect Lapland Longspurs. To EC's knowledge these follow-up studies have not been completed. Myers-Smith et al.

(2006) also observed a significant decrease in moss and lichen cover near roads and an increase in gramminoid cover after two decades of dust deposition adjacent to the Dalton Highway in Alaska. In this study, effects of dust were most pronounced up to 25 m from the road, and changes in vegetation composition were observed beyond 100 m. Long-term changes in vegetation composition from dust deposition along the proposed Highway could therefore alter the abundance and composition of bird species in the long-term within a relatively narrow zone of influence. Male and Nol (2005) noted, however, that the application of dust suppressant greatly minimized rates dust deposition. The Proponent has committed to controlling dust generated in relation to the construction and operation of the Highway through the application of non-toxic dust suppressant techniques.

Many of the Proponent's conclusions with respect to impacts of the Highway on wildlife are predicated on the assumption that traffic levels will be between 150-200 vehicles/day. EC recommends that seasonal traffic levels on the proposed Highway be monitored each year to verify this assumption and included in future monitoring reports.

EC agrees with the Proponent's assessment that impacts of indirect habitat loss due to construction and operation of the Highway will be minor in the context of regional bird populations. The Tuktoyaktuk Peninsula generally supports much lower densities of migratory birds than are found within the Mackenzie River Delta, which is considered a key terrestrial habitat site for migratory birds (Latour et al. 2008). EC considers areas that support >1% of the national population of at least one migratory species for at least part of its annual cycle as key habitat sites for migratory birds. The absence of any such areas along the proposed highway corridor lends support to the Proponent's conclusion that impacts from the Highway will be minor in the context of regional bird populations.

Environment Canada's Recommendations:

EC recommends the Proponent monitor traffic levels on an annual basis once the Highway is operational and seasonal traffic levels should be considered and reported with the results of future wildlife monitoring studies outlined in the draft Wildlife Effects Monitoring Program.

Literature Cited:

Benítez-López, A., R. Alkemade, and P. A. Verweij. 2010. The impacts of roads and other infrastructure on mammal and bird populations: a meta-analysis. Biological Conservation 143:1307-1316.

Fahrig, L. and T. Rytwinski. 2009. Effects of roads on animal abundance: an empirical review and synthesis. Ecology and Society 14:21.

Gebauer, M., Crampton, A., Lee, C., Boulanger, J., Shaw, J. and Laing, I. 2012. Meadowbank Mine – 2011 Wildlife Monitoring Summary Report. Nunavut Environmental Consulting Ltd. 123 pgs.

Male, S. K. and E. Nol. 2005. Impacts of roads associated with the Ekati Diamond Mine (TM), Northwest Territories, Canada, on reproductive success and breeding habitat of Lapland Longspurs. Canadian Journal of Zoology 83:1286-1296.

Myers-Smith, I. H., B. K. Arnesen, R. M. Thompson, and F. S. Chapin III. 2006. Cumulative impacts on Alaskan arctic tundra of a quarter century of road dust. Ecoscience 13:503-510.

Pease, M.L., R.K. Rose, and M.J. Butler. 2005. Effects of human disturbances on the behavior of wintering ducks. Wildlife Society Bulletin 33(1): 103-112.

Issue #11 – Bird Mortality due to Vehicle Collisions

Reference(s)**:**

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Environmental Impact Statement for the Construction of the Inuvik to Tuktoyaktuk Highway, NWT, May 2011, Section 4.2.7.6

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to the March 8, 2012 Information Requests (Round 2), March 30, 2012, IR #116

Proponent's Conclusion:

Bird mortality through vehicular collisions and increased access for hunting were identified as potential impacts to birds from construction and operation of the Highway. To mitigate potential mortality of birds during construction of the Highway, the Proponent committed to communicating presence of birds on the road to other drivers, reducing speeds or stopping vehicles when birds are on the road, and prohibiting hunting by highway construction and maintenance workers. To estimate potential mortality from vehicle collisions during operation of the Highway, the Proponent provided bird mortality data from monitoring along roads associated with the Ekati, Diavik, and Snap Lake diamond mines, the Meadowbank mine public access road and the Tibbitt to Contwoyto Winter Road (Response to IR#116). It was assumed that with an estimated 150-200 vehicles/day and a posted speed limit of 80 km/hr, bird-vehicle collision rates would be less than those reported in areas with higher human population densities and traffic volumes (e.g. U.S., southern Canada). The Proponent estimated that bird mortalities along the proposed Highway would be similar to those recorded at the Meadowbank mine public access road (6.67 bird mortalities per year, or 0.06 bird mortalities per kilometer per year). The Proponent committed to posting signage along the Highway to indicate areas of high wildlife use, including bird advisory signs. The Proponent concluded that the number of birds killed by vehicle collisions each year will represent an insignificant fraction of the overall number of birds harvested in the region.

Environment Canada's Conclusions:

The Proponent has provided reasonable estimates of potential bird mortality from vehicle collisions during operation of the Highway based on the assumed traffic volume of 150-200 vehicles/day. It should be noted that the Proponent predicted that dust deposition will increase albedo and may lead to earlier snow melt along the Highway corridor, potentially accelerating green-up by 10-14 days in the spring. This could create areas that are more attractive to migratory birds in the spring within a 100 m zone on either side of the Highway and in turn increase the risk of mortality from collisions with vehicles due to increased concentrations of birds near the road.

EC agrees with the Proponent's conclusion that the level of annual bird mortality due to vehicle collisions during operation of the Highway is unlikely to substantially reduce the abundance of bird species harvested within the regional study area. However, EC supports the Proponent's commitment to "*Educating users of the Highway that wildlife have the right-of-way at all times*" and "*Posting signage along the Highway, emphasizing areas of high wildlife use*" (Table F – Developer Commitments, September 28, 2012).

Environment Canada's Recommendations:

No further recommendations.

Issue #12 – Cumulative Effects Assessment for Species at Risk

Reference(s)**:**

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Environmental Impact Statement for the Construction of the Inuvik to Tuktoyaktuk Highway, NWT, May 2011, Sections 3.1.10, 4.2.7.1,4.2.7.6, and 5.0
Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Response to the March 8, 2012 Information Requests (Round 2), March 30, 2012, IR #114

EC letter to EIRB, 15 June 2012

Kavik-Stantec Inc., Inuvik-Tuktoyaktuk Highway Baseline Data Acquisition Program: Wildlife Habitat Potential Mapping – Final Report + Wildlife Metrics + Appendices, August 17, 2012

Kavik-Stantec Inc., Supplemental wildlife maps and metrics, August 28, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Supplemental Cumulative Effects Documentation, September 04, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Erratum in Supplemental Cumulative Effects Analysis, September 12, 2012

Government of the Northwest Territories Department of Environment and Natural Resources (GNWT-ENR) responses to IR 73, 74, and 75 (May 11, 2012)

Government of the Northwest Territories Department of Environment and Natural Resources (GNWT-ENR) response to Public Hearings Undertaking No.3 – September 27, 2012

Hamlet of Tuktoyaktuk, Town of Inuvik, Government of the Northwest Territories, Supplemental Cumulative Effects Assessment – Supplemental Analysis, September 28, 2012

Government of the Northwest Territories Department of Transportation and Department of Environment and Natural Resources, Wildlife Effects Monitoring Program (WEMP) – Discussion Draft, October, 2012

Proponent's Conclusion:

The Proponent provided a supplemental cumulative effects analysis for barren-ground caribou, boreal woodland caribou, grizzly bear, Short-eared Owl, Horned Grebe, Rusty Blackbird and Peregrine Falcon based on a revised study area boundary that extended from the western shores of the Husky Lakes to the eastern side of the Mackenzie River, and from the boundary between the Inuvialuit and Gwich'in settlement regions north to Tuktoyaktuk. An assessment for Wolverine was provided in the Proponent's response to IR #114. The temporal boundaries for the assessment identified in section 5.0 of the EIS considered the 4 year construction phase and the first 6 years of highway operations. The temporal boundaries do not appear to have been revised in the supplemental cumulative effects analysis provided on September 28, 2012.

Existing developments considered in the assessment included the buried Ikhil natural gas pipeline and the Tuktoyaktuk to Source 177 Access Road. Proposed developments considered included the Highway, the Mackenzie Gas Project (MGP; including the Parsons Lake development and pipelines), the South Parsons Lake Gas Supply Project and the Tuktoyaktuk Harbour Project.

The Proponent's assessment mainly focused on potential interactions between past, existing and foreseeable developments during the operational phase of the Highway. The footprint of the proposed Highway (378.67 ha) and associated primary borrow sources (1,305.08 ha) were estimated to impact 0.28% of the 587,002.91 ha cumulative effects study area. The direct footprint for all existing and proposed projects was estimated to be 2,123.84 ha, representing 0.36% of the cumulative effects study area.

The Proponent also evaluated potential indirect effects to VECs within a 1 km zone of influence around project footprints. The direct footprint of the Highway and borrow sources plus a 1 km zone of influence was estimated to cover 5.83% (34,216.05 ha) of the total cumulative effects assessment area. The combined area from all projects including this zone of influence accounted for 12.10% (71,049.18 ha) of the cumulative effects study area. However, the Proponent considered this to be an overly conservative estimate because they believed the zone of influence for existing and proposed buried pipelines would only be within the range of 5-20 m.

The existing buried Ikhil gas pipeline and the proposed MGP were the only projects identified that had footprints and zones of influence that overlapped with those of the proposed Highway. The areas of overlap among the zones of influence for the Ikhil pipeline and MGP and the zone of influence for the Highway each represented 0.29% of the cumulative effects study area. Based on the size of these areas of overlap, and the contention that the zones of influence were conservative estimates, the Proponent concluded that there would be limited opportunity for a potential cumulative effect to occur between the construction and operation of the Highway, and the existing Ikhil pipeline and proposed MGP.

Species-specific conclusions:

(*Note EC has only summarized the Proponent's conclusions for SARA-listed and COSEWIC-assessed species at risk, conclusions about cumulative effects on barren-ground caribou have not been included here)*

Woodland Caribou (Boreal Population) – SARA Schedule 1 - Threatened:

In their response to IR #117, the Proponent indicated that the proposed Highway alignment did not overlap with the NWT North boreal caribou ranged indentified in the proposed federal recovery strategy for boreal woodland caribou that was posted on the Species at Risk Public Registry in August 26, 2011. However, the Proponent identified that the GNWT-ENR has data from collared caribou that show annual movements in areas south of the Highway north to Husky Lakes, suggesting that some boreal caribou do use the cumulative effects study area. Based on a more recent map issued for review by the NWT Species at Risk Committee, approximately 25 km of the Highway alignment crosses the revised boreal caribou range. This section of the Highway corridor plus a 500 m buffer would cover an area of 3,590 ha within the updated NWT boreal caribou range.

The Proponent stated that the only other development within this portion of the range that could potentially interact with the proposed Highway was the proposed MGP pipeline. The Proponent predicted there would be minimal opportunity for a potential cumulative effect on boreal caribou to occur between the proposed Highway and the MGP.

Grizzly Bear – COSEWIC – Special Concern:

The Proponent identified that the only area where the 1 km zone of influence of the Highway project overlaps with the grizzly bear denning area delineated by the GNWT-ENR is in the vicinity of the Parsons Lake Gas project. The Proponent concluded that there would be minimal opportunity for cumulative effects on grizzly bears because Highway construction would be completed and the Highway in operation well before construction of the Parsons Lake Gas project.

Avian species at risk:

The Proponent estimated cumulative effects on habitat for avian species at risk using the habitat suitability models they developed to assess project-specific effects on these species. Extrapolation of the habitat suitability models to the cumulative effects study area was based on assumed equivalencies between the vegetation classification conducted within the project study area (1 km wide corridor around the Highway alignment and borrow sources) and vegetation classes in the Earth Observation for Sustainable Developments of Forests (EOSD) land cover data that was available for the entire cumulative effects study area.

Short-eared Owl – SARA Schedule 1 – Special Concern:

Thirteen Short-eared Owls were observed during 1 day of aerial surveys and 3 days of ground-based surveys conducted within the project study area in summer 2012. Based on the ground-based habitat assessment, cottongrass-tussock was classified as the only vegetation type providing high suitability nesting habitat for Short-eared Owl.

The cottongrass-tussock vegetation type was considered comparable to the EOSD land cover classes “Wetland-herbs” and “Herbs”. The direct footprint of the Highway and primary borrow sources was calculated to result in the loss of 0.39% (78.86 ha) of available cottongrass-tussock habitat in the cumulative effects study area, and 6.16% of available cottongrass-tussock habitat was within the 1 km zone of influence. The low volume of traffic anticipated for the Highway was expected to result in localized, short-term and rapidly reversible disturbance effects on Short-eared Owl in the immediate vicinity of the Highway.

The direct footprint of the Highway plus other existing and proposed projects was expected to impact 0.51% of available cottongrass-tussock habitat. Including the 1 km zone of influence, 10.32% of available cottongrass-tussock habitat might be affected. The Proponent concluded that, since there was no overlap between the potential 1 km zones of influence of the Highway and the proposed South Parsons Gas Supply Project, the Parsons Lake Gas project and the MGP, there would be limited opportunity for cumulative effects on Short-eared Owl.

Horned Grebe (Western Population) – COSEWIC – Special Concern:

Three Horned Grebes were observed during field surveys conducted in summer 2012. Wetlands <2 ha in size associated with the riparian sedge-cottongrass vegetation type (equivalent to "Wetland-herb" and "Herbs" EOSD cover classes) were classified as high suitability for Horned Grebes. Twenty-four (24) wetlands rated as high suitability were identified within the 1 km Highway corridor study area; however, it was noted that Horned Grebes were more likely to be found along the southern portion of the Highway. The Proponent concluded that there was no potential for cumulative effects on Horned Grebes given the limited use of ponds near the proposed Highway, the proposed timing for construction (winter), the expected low volume of traffic on the Highway, and with the implementation of additional mitigation measures for birds.

Rusty Blackbird – SARA Schedule 1 – Special Concern

No Rusty Blackbirds were observed during summer 2012 field surveys. Shrub height and density in most vegetation types were considered to be too low to provide suitable nesting habitat. Riparian shrub and black spruce/riparian shrub (comparable to "Coniferous", "Mixedwood", and "Broadleaf" EOSD cover classes) were considered the only vegetation types that would provide suitable nesting habitat for Rusty Blackbirds. Given that the Highway project is near the northern limits of the Rusty Blackbird's range, that the proposed timing for construction is during winter, the low expected volume of traffic on the Highway, and the implementation of additional mitigation measures for birds, the Proponent concluded there was no potential for cumulative effects on Rusty Blackbirds.

Peregrine Falcon (anatum-tundrius complex) – SARA Schedule 1 – Special Concern:

The Proponent developed a habitat suitability model for Peregrine Falcon that considered steep slopes (grade above 85%) as providing high suitability nesting habitat. Potential nesting habitat consisting of a few low, relatively steep slopes were investigated during summer 2012 field surveys, but no evidence of any Peregrine Falcons nesting at these locations was observed. Three individual Peregrine Falcons were observed during field surveys, but all were believed to be immature birds that were unlikely to be occupying breeding territories. Based on the absence of suitable nesting habitat in the cumulative effects study area, the Proponent concluded that there was no potential for cumulative effects on this species to occur.

Wolverine (Western Population) – COSEWIC – Special Concern

The Proponent considered increased mortality from harvest or problem animal control at camps, changes in prey or carrion availability and avoidance of human developments as potential cumulative effects for Wolverine (Response to IR #114). The Proponent concluded that waste management and deterrent practices for the Highway project and those proposed

at other developments would be sufficient to mitigate potential increases in mortality. The Proponent deemed that it was not possible to assess effects on wolverine due to changes of caribou numbers in the cumulative effects study area. It was also concluded that the Highway was the only proposed project that could increase access for harvesting.

Environment Canada's Conclusions:

EC's request for the Proponent to provide a quantitative cumulative effects assessment for species at risk was motivated by the requirements of paragraph 16(1)(*a*) of the CEAA that states that every assessment by a review panel shall include a consideration of "…any cumulative environmental effects that are likely to result from the project in combination with other projects or activities that have been or will be carried out" as well as by guidance provided in the document *Addressing Species at Risk Considerations under the Canadian Environmental Assessment Act for Species Under the Responsibility of the Minister Responsible for Environment Canada and Parks Canada* (Environment Canada and Parks Canada, 2010).

Since the definition of "environmental effect" includes any change a project may cause to a listed wildlife species, its critical habitat or the residences of individuals of that species, it is important that cumulative environmental effects on listed wildlife species are considered in the environmental assessment process (Environment Canada and Parks Canada, 2010, pg. 39). As a matter of best practice, EC suggests that species under consideration for listing on SARA, including those designated as at risk by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), be considered during an environmental assessment in a similar manner.

The Proponent has provided a quantitative assessment of potential cumulative effects on species at risk from direct and indirect habitat loss from existing and reasonably foreseeable projects within their selected cumulative effects study area. Although EC agrees with the Proponent's conclusion that there is limited potential for significant cumulative effects on Horned Grebe, Rusty Blackbird, Short-eared Owl and Peregrine Falcon, EC has noted several issues with the Proponent's assessment that diminish the level of certainty in their conclusions. EC does not agree with the Proponent's conclusion that there is limited opportunity for cumulative effects on grizzly bear.

Extrapolation of habitat suitability models to the cumulative effects study area

EC appreciates the additional field surveys and habitat suitability modeling undertaken by the Proponent to refine the assessment of project-specific impacts to species at risk within the 1 km wide project study area centered on the Highway corridor and primary borrow sources. Unfortunately, the more precise vegetation classification scheme that was used to define habitat suitability models for species at risk within the project study area was not available at the scale of the entire cumulative effects study area. Although the Proponent noted which broad EOSD vegetation classes were equivalent to the 11 vegetation types used in the vegetation atlas for the Highway corridor, each vegetation type often corresponded to more than one EOSD vegetation class and vice versa. This makes conclusions based on the extrapolation of the habitat suitability models to the broader cumulative effects study area imprecise. EC has also noted below that errors were made in the estimates for direct and indirect cumulative habitat loss for Short-eared Owl on the basis of EOSD equivalencies that resulted in an underestimate of potential impacts.

Poorly defined temporal scope of the assessment

Although the spatial boundaries for the assessment were enlarged in the Proponent's supplemental analyses, the temporal scope of the assessment indentified in the EIS, consisting of 4 years of Highway construction and 6 years of Highway operations, seems to have been retained and is too narrow considering that a window of 50 years was used to estimate granular resources requirements for construction and maintenance of the Highway. Despite the greater focus on the operations phase in the supplemental cumulative effects analysis, there was no clear definition of how long the operations phase would be, and therefore how long residual effects from the Highway project and other developments might act in a cumulative manner.

EC considers that the loss of terrestrial wildlife habitat within the footprint of the Highway will be a residual effect that will last throughout the operational life of the project. EC assumes the operational life of the project will be at least 50 years. Borrow sources used to supply aggregate for construction of the Highway may also result in long-term habitat loss if they continue to be used for highway maintenance and because reclamation of disturbed tundra habitat can take several decades (McKendrick, 1997; Forbes and Jeffries, 1999; Rausch, 2006).

Generic zone of influence used for all species

The Proponent used a 1-km zone of influence to assess indirect effects to habitat for all VECs, but expert advice provided by the GNWT-ENR (ENR responses to IR#73 and Undertaking #3) suggested that a larger 2-4 km ZOI would have been more reasonable for barren-ground caribou. GNWT-ENR agreed that a 1 km zone of influence was adequate to assess areas of reduced habitat effectiveness for grizzly bear (ENR response to Undertaking #3). For avian species with smaller home ranges or breeding territories, the 1 km zone of influence may have been overly conservative, and was not consistent with the zones of influence used to assess project-specific effects (Supplemental wildlife maps and metrics, 28 August 2012). The Proponent also stated that their assessment was overly conservative because they believed that buried pipelines would be more likely to have a zone of influence of 5-20 m. EC is of the view that the cumulative effects analysis should have used species-specific zones of influence that were based on available science rather than a generic 1 km zone of influence for all species.

Inconsistent and unclear criteria used to support conclusions

In section 5.0 of the EIS, the Proponent uses the Canadian Environmental Assessment Agency's broad definition of "cumulative effects" as effects that "are likely to result from the project in combination with other projects or activities that have been or will be carried out". However, in the supplemental cumulative effects analysis, the Proponent sometimes justified their conclusions using a narrower view that a cumulative effect was only possible if the footprints or zones of influence for different projects overlapped with one another (i.e. only synergistic effects).

In other cases, the Proponent's conclusions are based on the total area of incremental habitat loss or the total area of decreased habitat effectiveness within zones of influence, expressed as a proportion of the cumulative effects study area, or in the case of barren-ground caribou, their entire winter range. EC considers that habitat lost to the Highway and

borrow sources will be additive to the footprints of other existing and foreseeable projects in the study area, and thus can be considered as a cumulative effect.

In the EIS, the Proponent used three classes to rank potential cumulative effects and to determine the significance of these effects. The Proponent stated that because the VECs did not include readily measurable or quantifiable parameters, the classes were used as general guidance to rank effects. The classes used were as follows:

Class 1 Effect: The predicted trend in the measurable parameter under projected levels of development could threaten the sustainability of the VEC in the study area, and should be considered of management concern. Research, monitoring and/or recovery initiatives should be considered under an integrated resource management framework. Any negative change in VEC value of greater than 25% from benchmark is considered to be a Class 1 effect, regardless of VEC trend at the time of the assessment.

Class 2 Effect: The predicted trend in a measurable parameter under projected levels of development will likely result in a decline in the VEC to lower-than baseline but stable levels in the study area after Project closure and into the foreseeable future. Regional management actions such as research, monitoring and/or recovery initiatives may be required if additional land use activities are proposed for the study area before Project closure.

Class 3 Effect: The predicted trend in the measurable parameter under projected levels of development may result in a decline in the VEC in the study area during the life of the Project, but VEC levels should recover to baseline after Project closure. No immediate management initiatives, other than requirements for responsible industrial operational practices, are required.

Although the Proponent provided a more quantitative cumulative effects assessment in their Supplemental Cumulative Effects Analysis (Sept. 28, 2012), these effect classes were not used to rank the results of the supplemental analysis or to characterize support for their conclusions. The Proponent's approach to determining impact significance therefore lacked clear and consistent criteria identified at the outset, and instead relied largely on professional judgment.

Species-specific comments:

Woodland Caribou (Boreal Population):

Whereas the Proponent's assessment of cumulative effects on barren-ground caribou was based on the percentage of their entire winter range affected by project footprints and 1 km zones of influence, the assessment for boreal caribou only considered disturbance from project footprints in the context of the small portion of the NWT boreal caribou range that overlaps with the cumulative effects study area. This is inconsistent with the approach used to assess cumulative effects on boreal caribou presented in the proposed "Recovery Strategy for the Woodland Caribou (*Rangifer tarandus caribou*), Boreal Population, in Canada", which was referenced in EC information request #114. EC notes that the final recovery strategy was posted on the Species at Risk Public Registry on October 05, 2012[2].

[2] http://www.sararegistry.gc.ca/document/default_e.cfm?documentID=2253

The recovery goal for boreal caribou is to achieve self-sustaining local populations in all boreal caribou ranges throughout their current distribution in Canada, to the extent possible.

The recovery strategy demonstrates that the amount of disturbed habitat within each local boreal caribou population range can predict whether a local population is likely to be self-sustaining. The final recovery strategy defines disturbed habitat as being habitat showing: i) anthropogenic disturbance visible on Landsat at a scale of 1:50,000, including habitat within a 500 m buffer of the anthropogenic disturbance; and/or ii) fire disturbance in the last 40 years, as identified in data from each provincial and territorial jurisdiction (without buffer). Therefore, it would have been more appropriate for the Proponent to calculate how much new disturbance the Highway project would add to the entire NWT boreal caribou range, as well as that added by other reasonably foreseeable developments within the range. As noted in EC IR#114, geospatial files for the disturbance footprint within each boreal caribou range were publicly available shortly after the proposed recovery strategy was posted for public comment.

The Northwest Territories (NWT) South and NWT North population ranges originally identified in the proposed Recovery Strategy for boreal woodland caribou have now been combined into one population range, the Northwest Territories Range (NT1), in the final recovery strategy. Based on an assessment of satellite imagery and fire mapping current to 2009-2010, 31% of the Northwest Territories Range (NT1) has been classified as disturbed in the final recovery strategy. The amount of undisturbed habitat (69%) is currently above the 65% threshold identified as providing a 60% chance that a population will be self-sustaining.

Although the two ranges identified the proposed recovery strategy are now combined into one Northwest Territories Range (NT1) in the final recovery strategy, the northern limit of the range remained unchanged and does not overlap with the proposed Highway alignment. Therefore, based on the NWT boreal caribou range identified in the final recovery strategy, the project would not add new disturbance to the range.

EC recommends that, should the Northwest Territories Range (NT1) boundary in the final recovery strategy be revised in the future to reflect the new boundary issued for consideration by the NWT Species at Risk Committee, the disturbance maps for the revised range should be updated and account for new areas of disturbance created by the Highway project, using disturbance calculation methodology consistent with the National Recovery Strategy. These updated disturbance maps should be included within future range management plans for boreal caribou habitat in the NWT.

Grizzly Bear:

The Proponent focused their cumulative effects assessment for grizzly bear on potential disturbance to denning habitat. The Proponent stated that “no bear dens were observed in the 1 km study area during the KAVIK-STANTEC wildlife field surveys conducted in July 2012, nor during ENR surveys conducted in 2011”. This statement is not consistent with the map provided in Figure 3 of the draft Wildlife Effects Monitoring Program (WEMP; October 04, 2012) which indicates several ENR observations of grizzly bear dens along the Highway corridor in 2011.

The Proponent also states that: “*The only area where the potential 1 km zone of influence of the Highway Project is located within the GNWT ENR (2011a) delineated Grizzly bear*

denning area is in the vicinity of and to the north of the proposed Parsons Lake Gas project (Figure 11). No other potentially significant developments are currently located in the vicinity of the potential 1 km zone of influence of the proposed Highway in this area and none are anticipated to occur in this area for the currently foreseeable future."

EC's interpretation of Figure 11 of the Supplemental Cumulative Effects Analysis is that there is overlap between the zones of influence for the Parsons Lake Gas project and the Highway borrow source #309 which will be used to supply aggregate for highway maintenance over the first 40 years of operations (Erratum in Response to Information Requests Relative to Material Sources Raised at Technical Sessions; August 22 and 23, 2012). This suggests a potential spatial and temporal overlap for these zones of influence. Figure 11 also indicates that the footprints and zones of influence for the MGP, South Parsons Gas Supply project and existing Ihkil Pipeline overlap with the Grizzly Bear Denning Area identified by the GNWT ENR; however, EC agrees that these buried pipelines are unlikely to cause sensory disturbance to grizzly bears once constructed.

EC also notes the recent study by Northrup et al. (2012) showing that grizzly bears avoided roads with moderate traffic levels (20-100 vehicles per day) and strongly avoided roads with >100 vehicles/day. Grizzly bears were more likely to use areas near roads and to cross roads at night when traffic levels were low. These results suggest that the expected level of traffic on the proposed Highway (150-200 vehicles/day) may be sufficient to create a zone of avoidance near the road and to discourage crossing by grizzly bears during hours of peak traffic.

The Proponent's rationale that there would be minimal opportunity for cumulative effects on grizzly bear because Highway construction would be completed and the Highway in operation before construction of the Parsons Lake Gas project does not seem to consider that access roads and infrastructure for the Parsons Lake gas field could be operating concurrently with the Highway. EC therefore considers that there is potential for additive or synergistic cumulative effects from these two developments.

EC supports the Wildlife Effects Monitoring Program proposed by the Proponent as a means to monitor and detect potential direct and cumulative impacts on grizzly bear from construction and operation of the Highway and other proposed projects.

Short-eared Owl:

The Proponent's habitat suitability model for Short-eared Owl classified the cottongrass-tussock vegetation type as high suitability nesting habitat, and this vegetation type was considered comparable to the "Wetland-herbs" and "Herbs" EOSD cover classes. The Proponent stated that 78.86 ha of cottongrass-tussock habitat would be directly affected by the project, but, based on Table 2 in the Supplemental Cumulative Effects Analysis this only corresponds to the area of affected "Wetland-herb" habitat. According to Table 2, 65.42 ha of "Herbs" habitat would also be affected, meaning that 0.45% of the area of EOSD habitat classes equivalent to the cottongrass-tussock habitat would be directly affected by the project, not 0.39% as stated by the Proponent. The Proponent therefore also underestimated the direct cumulative footprint of all the past, present and foreseeable projects considered (0.58% vs. 0.51%), as well as the indirect cumulative footprint incorporating the 1km zones of influence (12.85% vs. 10.32%).

The figures provided in the Supplemental Cumulative Effects Analysis for the amount of cottongrass-tussock habitat disturbed are also inconsistent with the figures provided in the August 28, 2012 report providing an assessment of project-specific impacts. Although the total area of the borrow sources is similar in the two documents (1305.08 ha vs. 1289.8 ha), Tables 2 and 6 of the August 28 report indicate that a total 190.3 ha of cottongrass-tussock habitat would be within the project footprint. This is greater than the estimate provided in the cumulative effects assessment, even after applying the above-note correction for equivalencies between two vegetation classification systems (190.3 ha vs. 144.28 ha).

Despite these inaccuracies in the assessment, EC is of the view that incremental habitat loss and disturbance from the proposed Highway and existing and future developments would not be sufficient to have population-level consequences for Short-eared Owl.

Horned Grebe:

The Proponent's project-specific impact assessment for Horned Grebe identified that 24 high suitability wetlands occurred within the project study area, and that 20 of these wetlands occurred within 100 m of the preferred Highway alignment and primary borrow sources. The Proponent did not attempt to extrapolate the habitat suitability model for Horned Grebe beyond the project study area, so it is uncertain how many water bodies within the entire cumulative effects study area would be considered high suitability habitat for Horned Grebes or what proportion of these might be affected by existing and proposed developments.

Given the abundance of small lakes and wetlands in the cumulative effects study area, EC is of the view that incremental habitat loss and disturbance from the proposed Highway and existing and future developments would not be sufficient to have population-level consequences for Horned Grebe.

Rusty Blackbird:

The Proponent suggested that habitat suitability for Rusty Blackbirds within the project study area was likely to be determined by the availability of shrubs for nesting. Riparian shrub and riparian black spruce-shrub were identified as the only vegetation classes likely to provide suitable nesting habitat for Rusty Blackbird. The Proponent did not provide a quantitative estimate of potential loss of suitable habitat for Rusty Blackbird in section 3.6 of the Supplemental Cumulative Effects Analysis. Based on Table 3a of the Proponent's August 28, 2012 supplemental wildlife maps and metrics report, the project would affect 24.7 ha (3.18%; excluding borrow source PW2) of available suitable habitat in the project study area. Based on the stated equivalency of riparian shrub and riparian black spruce-shrub vegetation classes to "Coniferous", "Mixedwood" and "Broadleaf" EOSD cover classes, Tables 1 and 2 of the Supplemental Cumulative Effects Analysis suggest that 77.4 ha (0.24%) of available suitable Rusty Blackbird nesting habitat in the cumulative effects study area would be affected by the footprint of the Highway and borrow sources. Cumulatively, 112 ha (0.34%) of available suitable habitat could be affected by the footprints of past, present and future projects, and 9448 ha (29%) of available suitable habitat would lie within the 1 km zone of influence these projects.

The Proponent concludes that "*no potential residual environmental effects associated with the buried and revegetated Ikhil pipeline corridor and the future potential buried and reclaimed South Parsons Gas supply and MGP pipelines are anticipated to occur that could*

potentially interact with the low residual environmental effects predicted to occur in relation to the construction and operation of the Highway." EC is of the view that the construction of buried pipelines associated with the South Parsons Gas supply and MGP pipelines would likely necessitate the removal of shrub vegetation that could provide suitable nesting habitat for Rusty Blackbird and could thus have a residual effect on habitat availability, depending on the rate of revegetation of the pipeline right-of-ways.
Nevertheless, EC believes that the magnitude of cumulative loss of suitable habitat for Rusty Blackbirds within the cumulative effects study area would be unlikely to have population-level consequences for this species.

Peregrine Falcon:

EC agrees with the Proponent's assessment that the paucity of suitable nesting habitat within the cumulative effects study area minimizes the potential for cumulative impacts on Peregrine Falcon.

Wolverine:

EC agrees with the Proponent that the use of sound waste management practices and infrastructure design at construction camps for the Highway and other proposed developments will help to limit potential cumulative impacts on wolverine mortality due to "Defence of Life and Property" kills at industrial camps.

Environment Canada's Recommendations:

EC recommends:

- Areas of new disturbance created by the proposed Highway should be accounted for in future range management plans and/or action plans for boreal caribou in the NWT should the National Recovery Strategy range boundary for boreal caribou in the NWT be revised to align with the range in the NWT SARC status report. Disturbance should be calculated in the same manner as in the National Recovery Strategy for Boreal Caribou.
- The Proponent, in collaboration with GNWT-ENR and other wildlife co-management partners, further develop and implement the proposed Wildlife Effects Monitoring Program for wolverine, barren-ground caribou, grizzly bear and wolves to better understand how construction and operation of the Highway, as well as other foreseeable developments within the cumulative effects study area, influences their distribution, abundance and interactions as well as to identify further opportunities for mitigation and adaptive management.

Literature Cited:

Forbes, B. C. and R. L. Jefferies. 1999. Revegetation of disturbed arctic sites: Constraints and applications. Biological Conservation 88:15-24.

McKendrick, J.D., 1997. Long term recovery in northern Alaska. In: Crawford, R.M.M. (Ed.), Disturbance and Recovery in Arctic Lands: an Ecological Perspective. Kluwer Academic, Dordrecht, The Netherlands, pp. 503–518.

Northrup, J. M., J. Pitt, T. B. Muhly, G. B. Stenhouse, M. Musiani, and M. S. Boyce. 2012. Vehicle traffic shapes grizzly bear behaviour on a multiple-use landscape. Journal of Applied Ecology.

Rausch, J.C. 2006. Reclamation of gravel-dominated disturbances, Churchill, Manitoba, Canada. M.Sc. Thesis. University of Alberta. 171 pp.

6.0 COMMITMENTS SUMMARY

Throughout the review process EC has endeavoured to identify, assess and track the Proponent's commitments to actions and measures which, once implemented, will result in the elimination, reduction, mitigation and management of potential project impacts in areas of Departmental mandate. EC's ability to assess and track these commitments has been greatly aided and facilitated by the creation and periodic updating of the "Commitments Table" (Table F: Summary of Developer Commitments).

In the text of this submission EC has noted a number of the Proponent's commitments relevant to issues identified by the Department. For a comprehensive list of Proponent commitments which assist in addressing issues identified by EC in areas of Departmental mandate please see Appendix B.

Many of EC's requirements with regard to issues identified by the Department during the review process will be satisfied through the implementation of the various approaches to mitigation outlined by the Proponent in Table F: Summary of Developer Commitments. These include the issues of; blast residue (EC Issue #1), erosion and sediment control (EC Issue #2), storage tank systems (EC Issue #3), spill reporting (EC Issue #4), spill contingency planning (EC Issue #5), incineration (EC Issue #6) and bird mortality due to vehicle collisions (EC Issue #11). In general, EC is satisfied with the Proponents proposed approaches to mitigation of potential impacts in these areas and has no further recommendations with respect to these issues.

The Developers commitments will also assist in addressing issues identified by EC related to migratory birds and species at risk. However, EC has provided further recommendations with respect to the issues of; the Proponents Wildlife Management Plan (EC Issue #7), wildlife monitoring reports (EC Issue #8), mitigation measures for migratory birds (EC Issue #9), indirect habitat loss for migratory birds (EC Issue #10) and cumulative effects assessment for species at risk (EC Issue #12). EC's recommendations in these areas generally flow from the review of new material provided by the Proponent following the completion of the Public Hearings. Some reflect outstanding concerns. Fully addressing these issues may require further commitments on the part of the Proponents and/or the identification of appropriate measures on the part of the Board as suggested in EC's recommendations.

EC is of the view that potential adverse effects of the Project can be mitigated or minimized by full implementation of the Proponent's commitments and the recommendations provided in this report.

7.0 APPENDIX A: RELEVANT LEGISLATION, POLICIES AND GUIDELINES

The following summaries have been prepared for ease of reference and convenience only. For purposes of reliability and accuracy, and for interpreting and applying the Act, regulation or policy, it is recommended that the reader review the original document itself, including any subsequent amendments.

Canadian Environmental Protection Act, 1999

Proclaimed on March 31, 2000, the goal of the updated Canadian Environmental Protection Act, 1999 (CEPA) is to contribute to sustainable development through pollution prevention and the protection of the environment, human life and health from the risks associated with toxic substances. CEPA shifts the focus from managing pollution after it has been created to preventing pollution before it happens. CEPA provides the federal government with tools to protect the environment and human health, establishes strict deadlines for controlling certain toxic substances, and requires the virtual elimination of toxic substances which are bioaccumulative, persistent and result primarily from human activity. CEPA also manages environmental and human health impacts of products of biotechnology, marine pollution, disposal at sea, vehicle engine and equipment emissions, fuels, hazardous wastes, environmental emergencies, and other sources of pollution. Substances that are declared "toxic" under CEPA are added to the List of Toxic Substances in Schedule 1 of the Act.

<u>CEPA 1999 Guiding Principles</u>

Work under CEPA 1999 is guided by principles that contribute to and reinforce the importance of:

- Sustainable development - development that meets the needs of the present without compromising the ability of future generations to meet their own needs.
- Pollution prevention - the use of processes, practices, materials, products, substances or energy that avoid or minimize the creation of pollutants or waste and reduce the overall risk to the environment and human health.
- Virtual elimination - ensuring that releases into the environment of non-naturally occurring, persistent (meaning they take a long time to break down) and bioaccumulative substances (meaning they collect in living organisms) resulting from human activity are reduced to extremely low levels.
- Ecosystem approach - reflecting the dynamic interrelationships between living organisms (plant, animal and microorganism communities) and their non-living environment.
- Precautionary principle - where there are threats of serious or irreversible damage, lack of full scientific certainty will not postpone cost-effective measures to prevent environmental degradation.
- Intergovernmental cooperation - recognition that all governments in Canada face environmental problems that can benefit from cooperative resolution.
- Polluter-pays principle - producers and users of harmful substances, pollutants and wastes have a responsibility for bearing the costs associated with the safe use and disposal of these substances and wastes.
- Science-based decision making - decisions based on scientific information and traditional Aboriginal knowledge (where available), using a weight of evidence approach along with the application of the precautionary principle, where necessary.

Regulations

CEPA establishes authority to enact regulations or other control instruments to manage toxic substances to reduce or eliminate their release into the environment. Examples of preventive and control instruments include:

- Regulations;
- Pollution prevention plans;
- Environmental emergency plans;
- Environmental codes of practice; and
- Environmental release guidelines.

Environmental Emergency Regulations under CEPA

Part 8 of CEPA provides the authority for EC to require emergency plans for toxic or other hazardous substances. The Environmental Emergency Regulations are aimed at enhancing the protection of the environment and human life and health by promoting the preparedness for response to and recovery from environmental emergencies, at fixed facilities, of a release of a substance listed on Schedule 1 to the Regulations. The Regulations require those who own, have charge, management or control of toxic and hazardous substances set out in Schedule 1 to the Regulations at or above the specified thresholds to provide required information on the substance(s), their quantities and to prepare and implement environmental emergency plans. The primary goal of preparing and implementing an environmental emergency plan is to prevent emergencies from occurring and provide appropriate response activities in the event that an emergency does occur.

Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations under CEPA

These regulations came into force on June 12, 2008. The main objective of the new regulations is to prevent soil and groundwater contamination from storage tank systems located on federal and Aboriginal lands. The regulations cover tanks storing petroleum products and allied petroleum products, and compliance with these regulations is mandatory. For additional details and 'tank tips' please refer to: www.ec.gc.ca/st-rs.

For additional information, refer to:
http://www.ec.gc.ca/CEPARegistry/regulations/detailReg.cfm?intReg=70

Fisheries Act – Pollution Prevention Provisions

The Minister of Fisheries and Oceans is legally responsible to Parliament for administration and enforcement of all sections of the Fisheries Act. However, under a Prime Ministerial Instruction (1978) and a Memorandum of Understanding (1985), EC administers and enforces those aspects of the Act dealing with the prevention and control of pollutants affecting fish and fish habitat. In this context, EC works to:

- Advance pollution prevention technologies;
- Promote the development of preventative solutions; and
- Work with the provinces, territories, industry, other government departments and the public on issues relating to the pollution provisions of the Fisheries Act.

The Compliance and Enforcement Policy for the Habitat Protection and Pollution Prevention Provisions of the Fisheries Act states that compliance with the federal Fisheries Act is mandatory. Subsection 36(3) of the Fisheries Act specifies that, unless authorized by federal regulation, no person shall deposit or permit the deposit of deleterious substances of any type in water frequented by fish, or in any place under any conditions where the deleterious substance, or any other deleterious substance that results from the deposit of the deleterious substance, may enter any such water. Proponents should note that only a federal regulation under the Fisheries Act or another Act of Parliament can authorize a discharge of a deleterious substance as per Subsection 36(4); no federal permit, provincial, territorial or municipal regulatory permit or approval allows for exemption from the Fisheries Act.

The act of depositing a deleterious substance is a violation of the Fisheries Act, regardless of whether the water itself is made deleterious by the deposit. Subsection 36(3) of the Fisheries Act makes no allowance for a mixing or dilution zone. Any measurements or tests to determine whether something is deleterious should be done where the substance is at its highest concentration, typically at the point of discharge to the receiving water.

The applicable legislation can be found at:
http://laws-lois.justice.gc.ca/eng/acts/F-14/.

For additional information, refer to:
http://www.ec.gc.ca/ele-ale/default.asp?lang=en&n=D6765D33

Migratory Birds Convention Act

The purpose of the Migratory Birds Convention Act, 1994 (MBCA) is to implement the Convention for the Protection of Migratory Birds in Canada and the United States by protecting and conserving migratory birds, as populations and individual birds, their habitat and nests. The Migratory Birds Regulations provide for the conservation of migratory birds and for the protection of their nests and eggs. Subsection 5.1(1) of the MBCA prohibits depositing or permitting the deposit of a substance that is harmful to migratory birds in waters or an area frequented by migratory birds or in a place from which the substance may enter such waters or such an area. A prohibition against the disturbance, destruction, or taking of a nest, egg or nest shelter of a migratory bird without a permit is set out in subsection 6(a) of the Regulations. Possession of a migratory bird, nest or egg without a permit is also prohibited.

“Incidental take” is the killing or harming of migratory birds due to actions, such as economic development, which are not primarily focused on taking migratory birds. No permit can be issued for the incidental take of migratory birds or their nests as a result of economic activities.

For additional information, refer to:
http://www.ec.gc.ca/nature/default.asp?lang=En&n=7CEBB77D-1

Species at Risk Act

The Species at Risk Act (SARA) is intended to prevent species from becoming extirpated or extinct; to provide for the recovery of extirpated, endangered or threatened species; and to

manage species of special concern. The Act applies to all of Canada; all wildlife species listed as being at risk; their residences and their critical habitat.

The Governor in Council may, on the recommendation of the Minister, by order, provide that section 32 and 33, or either of them, apply in lands in a province that are not federal lands with respect to individuals of a listed wildlife species that is not an aquatic species or a species of birds that are migratory birds protected by the Migratory Birds Convention Act, 1994.

Risk Categories

The Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is an independent, expert committee that assesses the level of risk to wildlife species. Assessments are based on the best available science, Aboriginal traditional knowledge, and community knowledge. Species may be assigned to the following categories:

- Special Concern (SC) species may become threatened or endangered because of a combination of biological characteristics and identified threats;
- Threatened (THR) species are likely to become endangered if nothing is done to reverse the factors leading to extirpation or extinction;
- Endangered (END) species face imminent extirpation or extinction from the wild in Canada;
- Extirpated species no longer exist in the wild in Canada, but do exist elsewhere in the world;
- Extinct species no longer exist in the world;
- Not at Risk means a species that has been evaluated and found to be not at risk of extinction given the current circumstances; and
- Data Deficient applies when the available information is insufficient to resolve a wildlife species' eligibility for assessment or to permit an assessment of the wildlife species' risk of extinction.

SARA Listing

In 1999, COSEWIC adopted new assessment criteria based on World Conservation Union criteria. The relevant Minister (the Minister of the Environment and/or the Minister of Fisheries and Oceans, depending on the species), after receiving the COSEWIC assessment, consults the affected parties with respect to the proposed listing (as appropriate). After consultation, the Minister can recommend one of three things: accept the assessment and recommend that the species be added to Schedule 1; decide not to list the species; or refer the matter back to COSEWIC for more information. In cases where the species was already listed, the Minister of the Environment can also recommend that the species be reclassified or removed from Schedule 1.

Recovery Actions

Once listed, the relevant Minister must complete, and post on the public registry, recovery strategies and action plans for endangered, threatened or extirpated species and management plans for species of special concern. Recovery strategies are planning documents that identify actions that need to be taken to conserve the species such as stopping or reversing the decline of a species. Action plans outline the specific projects or

activities required to meet the goals and objectives outlined in the recovery strategy. Recovery strategies must be completed within one year of listing for endangered species and two years of listing for threatened or extirpated species. Action plans are to be completed within the timelines set out within the recovery strategies.

Management plans set goals and objectives for maintaining sustainable population levels of species that are particularly sensitive to environmental factors, but not in danger of becoming extinct.

General Prohibitions

The prohibitions under sections 32 and 33 of SARA, which came into force in June 2004, make it an offence to:

- 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;
- Possess, collect, buy, sell or trade an individual of a wildlife species that is listed as an extirpated species, an endangered species, or a threatened species, or any part or derivative; or
- Damage or destroy the residence of one or more individuals of a wildlife species that is listed as an endangered or threatened species or that is listed as an extirpated species if a recovery strategy has recommended its reintroduction into the wild in Canada.

The application of these prohibitions will vary depending upon the circumstances:

- These prohibitions apply to all migratory birds, as protected by MBCA and all listed aquatic species, as defined in SARA, on all federal, territorial, provincial and private lands.
- These prohibitions also apply to all species on federal lands in the provinces and on lands in the territories under the authority of the Minister of the Environment (i.e., National Wildlife Areas, Migratory Bird Sanctuaries, and National Parks).
- These prohibitions may apply with respect to species (that are not migratory birds or aquatic species) on the remaining lands within a province or a territory by order of the Governor in Council if they are not protected effectively by a province or territory.

Critical Habitat Prohibitions

Under SARA, it is prohibited to destroy any part of the critical habitat, as identified within a recovery strategy or action plan, of an endangered or threatened species. It is also prohibited to destroy any part of the critical habitat of an extirpated species if a recovery strategy has recommended that the species be reintroduced to Canada. These prohibitions apply anywhere in Canada, with respect to listed aquatic species as defined in SARA and listed migratory birds protected under MBCA. The application of these prohibitions to other species depends upon the land involved:

- The prohibition applies to critical habitat identified within a National Park, Migratory Bird Sanctuary, or a National Wildlife Area within 90 days after the description of the critical habitat is published in the Canada Gazette.

- With respect to critical habitat on other federal lands that is not already protected by provisions in, or measures under SARA or another Act of Parliament, the prohibition applies once a Ministerial Order has been made by the appropriate competent minister.
- With respect to critical habitat on non-federal lands (provincial or private lands), the prohibition applies once an Order in Council has been made by the Governor in Council.

Environmental Assessment and Species at Risk

SARA requires that certain considerations are addressed during the environmental assessment phase of a project. Specifically, it requires that:

- adverse effects of the project on listed wildlife species and their critical habitat be identified and that the competent minister(s) be notified of these effects without delay;
- all measures have been taken to avoid or lessen those adverse effects in a way that is consistent with any applicable recovery strategy or action plan; and
- monitoring be undertaken in respect of those adverse effects.

For additional information, refer to:
http://www.ec.gc.ca/alef-ewe/default.asp?lang=en&n=ED2FFC37-1

The applicable legislation can be found at:
http://laws-lois.justice.gc.ca/eng/acts/S-15.3/

Canadian Council of Ministers of the Environment Canada-wide Standards

The Canada-wide Environmental Standards Sub-agreement is a framework for federal, provincial, and territorial Environment Ministers to work together to address key environmental protection and health risk reduction issues that require common environmental standards across the country. Set under the framework of the Canada-wide Accord on Environmental Harmonization, the standards sub-agreement sets out principles for governments to jointly agree on priorities, to develop standards, and to prepare complementary work plans to achieve those standards, based on the unique responsibilities and legislation of each government. The sub-agreement does not change the jurisdiction of governments nor does it delegate authority.

A defining characteristic of the Canada-wide standard process is the accountability of each jurisdiction to ensure the implementation of approved Canada-wide standards. Section 6 of the Canada-wide Standards Sub-agreement, sets out requirements and suggestions regarding implementation, with the objective of ensuring co-operative, effective, accountable and consistent implementation of each standard.

Canada-wide Standards for Mercury Emissions

Mercury is a naturally occurring substance, which is transformed through biological processes to methyl mercury, a persistent substance which bioaccumulates in the food chain and is particularly toxic to humans and wildlife. Mercury levels originate from a combination of naturally-occurring mercury and anthropogenically emitted mercury. Levels in any one region reflect variable combinations of local, regional and even global sources.

Approximately sixty percent of the mercury entering the ecosystem is from anthropogenic sources.

Recognizing the hazard posed by anthropogenically emitted mercury entering the food chain, the CCME ministers agreed in June 2000 to the Canada-wide Standards for Mercury Emissions. The CWS set limits for mercury emissions from several sectors, including incinerators.

For more information, refer to:
http://www.ccme.ca/assets/pdf/mercury_emis_std_e1.pdf

Canada-wide Standards for Dioxins and Furans

Polychlorinated dibenzo-p-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs), commonly known as dioxins and furans, are identified as toxic under CEPA, are persistent, bioaccumulative, and result predominantly from human activity. Due to their extraordinary environmental persistence and capacity to accumulate in biological tissues, dioxins and furans are slated for virtual elimination under CEPA, the federal *Toxic Substances Management Policy* and the CCME *Policy for the Management of Toxic Substances*.

Recognizing the hazard posed by dioxins and furans entering the environment, the CCME ministers agreed, in May 2001, to the Canada-wide Standards for Dioxins and Furans. These standards set limits for dioxin and furan emissions from several sectors including incinerators.

For more information, refer to:
http://www.ccme.ca/assets/pdf/d_and_f_standard_e.pdf

8.0 APPENDIX B: PROPONENT COMMITMENTS RELEVANT TO ISSUES IDENTIFIED BY EC (BASED ON - TABLE F: SUMMARY OF DEVELOPER COMMITMENTS)

TABLE F: SUMMARY OF DEVELOPER COMMITMENTS CROSS-REFERENCED WITH ENVIRONMENT CANADA ISSUES AND LEGISLATION		
Developer Commitments	EC Issue #/Topic	Applicable EC Legislation
PLANNING AND DESIGN		
Research authorizations will be obtained on an annual basis, as needed, prior to the conduct of seasonal field activities.	EC does not anticipate the need for any research permits under provisions of the MBCA or SARA	
The Developer commits to using, as a guideline, the design parameters and construction techniques in the Transportation Association of Canada (TAC 2010) Development and Management of Transportation Infrastructure in Permafrost Regions. This will include mitigation strategies such as: -Applying appropriate erosion and sediment control BMPs for the construction of ditches and cross drainage channels; -Accessing and hauling from borrow sources during the winter months;	Issue #2 – Erosion and Sediment Control	Fisheries Act's Pollution Prevention Provisions (FA PPP)

-Constructing embankments during the winter months; -Conducting summer construction activities (such as grading and compacting the embankment, and placing of surfacing materials) only when the Highway can be accessed over the embankment; -Stockpiling surfacing material along the embankment during the winter for use in the summer; -Minimizing the surface area of open cut; -Grading slopes to minimize slumping; -Grading material storage and working areas to promote drainage ; -Reclaiming borrow sources when construction is complete by grading slopes to blend with the natural topography and drainage of the surrounding area; -Designing and constructing thick or high embankments to create an insulative layer that promotes the development of a frozen embankment core; -Designing the alignment to avoid unfavourable terrain, such as areas with thick organic deposits and ice-rich polygonal or patterned ground; -Installing culverts to manage seasonal overland flows; -Installing sufficient cross drainage during construction to prevent or minimize potential water ponding; and -Inspecting and maintaining culverts, as needed, in the spring and fall.		
Mitigation options that will be considered and employed will include: - Installation of geotextile – the geotextile will assist in maintaining the integrity of the Highway embankment by minimizing the loss of material from the embankment into the underlying terrain. - Selection of the appropriate embankment height and side slope ratio for the specific terrain type. - Efficient drainage design - ensuring flow of water, in the spring/summer with defined stream and surface run-off to avoid or minimize standing water (ponding). - Appropriate selection (i.e., type and size) and installation of drainage structures, including proper end treatments for culverts such as erosion control and drainage aprons.	Issue #9 - Bird Mortality due to Vehicle Collisions: This commitment may help to reduce migratory bird attraction to areas near the highway and reduce potential for wildlife collisions	Migratory Birds Convention Act (MBCA), Migratory Birds Regulations (MBR), Species at Risk Act (SARA)
CONSTRUCTION		
The Developer and its contractors will adhere to all applicable legislation, regulations, guidelines, and terms and conditions.	General Broadly applies to all or many EC issues, legislation and regulations identified in the written submission	
The Developer and on-site Project contractors, including all field operations staff, will be made aware of and implement the mitigation measures identified in this EIS.	General Broadly applies to all or many EC issues, legislation and regulations identified in the written submission	
The Developer and on-site Project contractors, including all field operations staff, will be made aware of and implement the mitigation measures identified in this EIS.	General Broadly applies to all or many EC issues, legislation and regulations identified in the written submission	
DOT will ensure that the Highway construction contractors will take all steps necessary to comply with the terms and conditions of all legislation, permits and licenses	General Broadly applies to all or many EC issues, legislation and regulations identified in the written submission	
The Developer is committed to constructing the proposed Inuvik to Tuktoyaktuk Highway, borrow sources, and associated winter access roads in a safe and environmentally responsible manner, and to strictly adhering to any mitigation measures as proposed by the Developer.	General Broadly applies to all or many EC issues, legislation and regulations identified in the	

	written submission	
Blasting, if required, will occur only during winter borrow source development.	Issue #1 – Blast Residue	FA PPP
The Developer is committed to performing the majority of the construction activities during the winter months.	Issue #9 – Mitigation Measures for Birds - Reduces the risk of incidental take of nests and eggs of migratory birds	MBCA, MBR, SARA
Highway construction activities during the summer period will be primarily limited to road base compaction and grading, and culvert remediation and maintenance with no work expected to take place on undisturbed land. These activities will be confined to the surface of the previously constructed Highway embankment.	Issue #9 – Mitigation Measures for Birds - Reduces the risk of incidental take of nests and eggs of migratory birds	MBCA, MBR, SARA
The developer is committed to controlling dust generated in relation to the construction and operation of the Highway through the application of non-toxic dust suppression techniques (water trucks) that comply with the GNWT's Guideline for Dust Suppression (GNWT 1998).	Issue #10 – Indirect Habitat Loss for Migratory Birds	MBCA, MBR, SARA
BORROW SOURCES		
The Developer will follow all applicable legislation and guidelines when developing and operating the borrow source.	General	
Pit Development Plans will include mitigation measures to address potential environmental concerns, and operational and reclamation plans. Mitigation measures include: -Developing borrow sources only during winter periods; -Maintaining an appropriate amount of undisturbed land between borrow source locations and any waterbody; and - Excavation and/or removal of material from the quarry should only take place to within one metre of the high water mark above the groundwater table; and - Applying appropriate erosion and sediment control BMPs for the construction of ditches and cross drainage channels.	Issue #2 – Erosion and Sediment Control	FA PPP
Erosion control and plans to control runoff from the borrow sites, including any stockpiles that may be developed, will be addressed in pit development plant plans. Site drainage controls, including localized ditching/swales within the borrow sites and silt fencing will be employed as necessary to ensure that sedimentation contained in meltwater from ground ice in the aggregate, or site runoff in general, are appropriately managed and are not released into the surrounding watershed.	Issue #2 – Erosion and Sediment Control	FA PPP

Where it is deemed preferable to install culverts in summer, construction will adhere to appropriate guidelines, such as those identified in Dane (1978) and in the DFO Land Development Guidelines for the Protection of Aquatic Habitats, to avoid or minimize the potential for erosion, sedimentation or channel effects.	As above	FA PPP
OPERATIONS		
The developer is committed to controlling dust generated in relation to the construction and operation of the Highway through the application of non-toxic dust suppression techniques (water trucks) that comply with the GNWT's Guideline for Dust Suppression (GNWT 1998).	Issue #10 – Indirect Habitat Loss for Migratory Birds	MBCA, MBR, SARA
MANAGEMENT PLANS		
An Environmental Management Plan (EMP) will be prepared prior to construction, and will be submitted for regulatory approval prior to use. The EMP will clearly define expectations for compliance monitoring, responsibilities, requirements for training, and reporting.	General	
An Environmental Management Plan will be developed to provide broad guidance relating to maintaining existing stream channel, fish habitat, and water quality conditions.	Issue #2 Erosion and Sediment Control	FA PPP
The installation of culverts and the construction of bridges will be guided by an Environmental Management Plan (EMP), which will include construction scheduling restrictions, environmental construction guidelines, methods to prevent spills of deleterious substances, erosion and sediment control plan, and monitoring plan.	Issue #2 Erosion and Sediment Control	FA PPP
The EMP will contain the following types of plans: -Environmental management; -Spill contingency; -Erosion and sediment control; -Pit development for borrow sources; -Fish and fish habitat protection; -Wildlife management; -Health and safety; -Waste management; -Hazardous waste management; and -Archaeological site(s) protection. Where necessary, the Developer and its contractor(s) will seek approval for the plans prior to use.	General Issue #2 – Erosion and Sediment Control Issue #4 – Spill reporting Issue #5 – Spill Contingency Plan Issue #6 - Incineration Issue #7 - Wildlife Management Plan Issue #9 – Mitigation Measures for Birds	FA PPP, CEPA (Canadian Environmental Protection Act 1999), MBCA, MBR, SARA
Spill Contingency Plan - The Developer will require that Project contractors prepare spill contingency plans, outlining spill reporting, containment, and clean-up. These will be completed by contractor(s) at least three months prior to the start of construction.	As above	CEPA
Hazardous Waste Management Plan - The Developer and/or contractor(s) will develop a hazardous waste management plan (HWMP) as part of land use permitting applications to the ILA and AANDC. The HWMP will encompass all pre-construction and construction phases of the Project and will apply to the Developer and all Project contractors involved in receiving, transferring, and transporting hazardous waste for the Developer's activities.	As above	CEPA
Waste Management Plan - The Developer and/or contractor(s) will develop a waste management plan for all wastes associated with preconstruction and construction activities as part of land use permitting applications to the ILA and AANDC. The waste management plan will apply to the Developer and all associated Project contractors involved in the generation, treatment, transferring, receiving, and disposal of waste materials for the Project.	As above	CEPA

Erosion and Sedimentation Control Plan - The Developer and/or contractor(s) will provide an erosion and sedimentation control plan to the ILA and AANDC as part of land use permitting. These plans will also be reviewed by DFO and Environment Canada.	As above	FA PPP
Wildlife and Wildlife Habitat Protection Plan - The Developer will develop and implement a wildlife (i.e. mammals and birds) and wildlife habitat protection plan in consultation with GNWT ENR, Environment Canada, WMAC, and HTCs.	Issue #7 - Wildlife Management Plan Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA
The Developer anticipates developing an Environmental Management Plan for the operations phase of the project. The operations EMP will be completed six months prior to the opening of the Highway to the public. This EMP will be developed in consultation with agencies such as the HTCs, WMAC, Environment Canada and GNWT ENR. The EMP will include guidelines and public education related to Highway usage and monitoring of highway user activities	Cumulative Effects, General Issue #7 - Wildlife Management Plan Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA
The EMP will include an adaptive management component, which will reference appropriate BMPs, guidelines, and techniques that are relevant to construction in northern latitudes, and indicate how they are to be applied under specific circumstances.	Cumulative Effects, General	
As part of the adaptive management program, a list of outstanding or new environmental issues that require further action or monitoring will be compiled at the end of each winter construction season and environmental management plans will be updated as needed.	Cumulative Effects, General	
SPILL CONTINGENCY PLAN		
The Developer will require that Project contractors prepare spill contingency plans, outlining spill reporting, containment, and clean-up, in accordance with INAC's Guidelines for Spill Contingency Planning (2007).		CEPA
A spill contingency plan will be developed which includes prevention, preparedness and response. Copies of the spill plan will be made readily available on site, and all staff will be familiar with operational procedures in the event of a spill. The Spill Contingency Plan will: - assign responsibilities to company staff and/or contractors and outline a clear path of response; - provide a list of agencies / persons to be contacted in the event of a spill including their phone numbers, etc.; - provide direction regarding response actions for spills on various types of terrain (e.g. spills on land, water, snow/ice, muskeg, etc.); - create and maintain a list and indicate location(s), both on and off site, of equipment available to be used in the event of a spill; - ensure an appropriate spill kit with absorbent material is located at all sites where fuel storage and transfer occurs; - ensure drip pans are utilized when refueling equipment; - ensure proper handling and disposal of contaminated materials resulting from the containment, clean-up, etc. of any spills; and state that all spills of oil, fuel, or other deleterious materials, regardless of size, are to be reported to the NWT 24-hour Spill Line 1-867-920-8130.		CEPA
The Developer will require that Project contractors prepare an Environmental Emergency Response Plan (if required, as per Part 8, Environmental Emergencies Regulations of CEPA 1999).		CEPA
The Developer will ensure that the Project contractor has appropriate spill response equipment on-site.		CEPA

All spills of oil, fuel, or other deleterious materials, regardless of size, are to be reported to the NWT 24-hour Spill Line (867) 920-8130. All releases of harmful substances, regardless of quantity, are immediately reportable where the release: - is near or into a water body; - is near or into a designated sensitive environment or sensitive wildlife habitat; - poses an imminent threat to human health or safety; or - poses an imminent threat to a listed species at risk or its critical habitat.	Issue #4 – Spill Reporting	CEPA
In the event of a spill, the Developer's contractors will respond according to the site-specific spill contingency plan and the contractor's HSE manual and procedures.	As above	CEPA
The Developer will require that Project contractors prepare spill contingency plans, outlining spill reporting, containment, and clean-up. These will be completed by contractor(s) at least three months prior to the start of construction.	As above	CEPA
The Developer will develop and implement an erosion and sedimentation control plan as part of the EMP. The plan will comply with appropriate erosion and sediment control guidelines, GNWT best management practices (currently being prepared in coordination with DFO), and measures outlined in the DFO (1993) Land Development Guidelines for the Protection of Aquatic Habitat. Some measures that will be followed include: -Limiting the use of construction equipment to the immediate footprint of the Highway or borrow source; -Minimizing vegetation removal and conducting progressive reclamation at the clear-span abutments, culvert installations and borrow sources; -Keeping ice bridge and ice road surfaces free from soils and fine gravel that may be tracked out by vehicles; -Avoiding the use of heavy equipment in streams or on stream banks during summer months, and the adherence to the DFO Operational Statement for Temporary Stream Crossings (DFO 2008), where this is deemed necessary; -Installing silt fencing and/or checking dams, and cross drainage culverts as necessary to minimize siltation in runoff near waterbodies; and -Appropriately sizing and installing culverts, based on hydrological assessments and local experience, to avoid backwatering and washouts.	Issue 32 - Erosion and Sediment Control	FA PPP
The Developer commits to ensuring that any exposed areas will be suitably stabilized prior to the spring thaw period.	As above	FA PPP
The Developer is committed to using heavy equipment during Highway embankment construction through the winter months when all watercourse crossing locations are frozen.	As above	FA PPP
FISH AND FISH HABITAT		
The Developer will conform to Section 36(3) of the Fisheries Act, prohibiting the deposit of a deleterious substance through implementation of erosion and sediment control measures.	Issue #2 – Erosion and Sediment Control	FA PPP
Sediment inputs from drainage ditches will involve implementation of sediment controls such as ditch breaks, silt fences, or ditch rerouting, in conjunction with an investigation to determine the source of the sediment. Streambank erosion will require temporary stabilization with mats or longer term armouring.	As above	FA PPP

Training will be provided for environmental monitors to identify sources and causes of erosion and sedimentation, but these individuals will also have access to professional engineers and biologists who can assist in identifying and rectifying potential or actual erosion sources.	As above	FA PPP
Erosion control and plans to control runoff from the borrow sites, including any stockpiles that may be developed, will be addressed in pit development plans. Site drainage controls, including localized ditching/swales within the borrow sites and silt fencing will be employed as necessary to ensure that sedimentation contained in meltwater from ground ice in the aggregate, or site runoff in general, are appropriately managed and are not released into the surrounding watershed.	As above	FA PPP
WILDLIFE AND WILDLIFE HABITAT		
General		
Prior to construction, the Developer will develop and implement species specific Wildlife Management Plans (WMP) that will include: - specific mitigation measures for Species at Risk, caribou, grizzly bears, moose, furbearers, and birds; - mitigation measures described in Section 4.2.7 of the EIS; - camp safety design features; - wildlife detection and deterrent strategies; - critical periods for wildlife species; - periods when sensitive wildlife species are likely to be present in the Project area; - recommended setbacks; - structure design features that will reduce or limit their potential use as nesting structures; - triggers for adaptive management; - appropriate linkages to other mitigation plans for weed control, dust management and waste management; and - wildlife monitoring parameters.	Issue #7 - Wildlife Management Plan Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA
The Developer will require its construction Contractors to conform with the Wildlife Management Plan (WMP) that will be developed for the Inuvik to Tuktoyaktuk Highway construction project.	Issue #7 - Wildlife Management Plan Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA
The Developer's contractor(s) will be responsible for educating and training staff on applicable practices contained within the Wildlife Management Plans and the Bear Safety Guidelines, including the proper use of non-lethal wildlife deterrent materials (e.g., bear spray).	Issue #7 - Wildlife Management Plan Issue #9 - Mitigation Measures for Birds	MBCA, MBR, and SARA
The Developer's contractor(s) will document the education and training provided to staff and provide evidence of such to regulators and in monitoring reports	Issue #7 - Wildlife Management Plan Issue #9 - Mitigation Measures for Birds	MBCA, MBR, and SARA
Camps and associated infrastructure will be designed to incorporate features that ensure safety for both personnel and wildlife, including installing adequate lighting, implementing proper waste management, cleaning and maintaining the kitchen and dining area, and implementing appropriate wildlife detection and deterrent strategies.	Issue #7 - Wildlife Management Plan	MBCA, MBR, SARA
Pre-disturbance surveys for critical habitat features (e.g., dens, nests) will be conducted prior to construction, in cooperation with GNWT ENR, as required. Survey results will be distributed in monitoring reports and provided to applicable regulators and interested parties, and may include mitigative measures to reduce potential effects.	Issue #7 - Wildlife Management Plan Issue #8 – Wildlife Monitoring Report Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA

All wildlife encounters and mortalities will be reported to the environmental monitor, Safety Advisor, and GNWT ENR	Issue #7 - Wildlife Management Plan Issue #8 – Wildlife Monitoring Report Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA
The Developer will implement general wildlife protection measures along the proposed Highway as follows: -Minimizing loss of habitat and the reduction of habitat effectiveness through Project design; -Educating users of the Highway that wildlife have the right-of-way at all times; -Posting signage along the Highway, emphasizing areas of high wildlife use; -Implementing a policy whereby Project personnel and contractors will not disturb any wildlife or critical habitat features such as dens or nests; -Implementing a system during the construction phase that serves to notify workers of wildlife presence in or near construction areas; -Hiring environmental monitors to during construction to watch for wildlife; -Adhering to spill contingency plans, as required, in a timely manner; -Conducting follow-up monitoring of spill sites to verify effectiveness; -Utilizing clean equipment, particularly when deployed in or near water; -Implementing appropriate dust control measures to minimize effects to habitat and forage quality; -Adhering to waste management plans and procedures to avoid attracting wildlife; -Timing construction activities to avoid critical periods; -Applying and conforming with pre-determined setback distances from key wildlife habitat features; -Implementing a “no hunting” policy for Highway construction and maintenance workers; and -Working with agencies such as the HTCs, WMAC and GNWT ENR to develop guidelines and conditions for Highway usage and follow-up with monitoring of harvesting activities.	Issue #7 - Wildlife Management Plan Issue #8 – Wildlife Monitoring Report Issue #9 - Mitigation Measures for Birds Issue #11 - Bird Mortality due to Vehicle Collisions	MBCA, MBR, SARA
The construction and/or operations phase Wildlife Mitigation and Monitoring Plan(s) will be reviewed with co-management groups such as the Hunter and Trapper Committees and the Wildlife Management Advisory Committee as the development of the plans proceeds.	Issue #7 - Wildlife Management Plan	MBCA, MBR, SARA
An annual construction monitoring report will be provided to applicable regulators and interested parties that will include: - Encounters and mortalities; - Notifications provided to workers regarding wildlife presence; - Waste management practices - Measures used to reduce disturbance to any nesting birds; - Dust control effectiveness; - Conformance with the Wildlife Management Plan, Environmental Management Plan, Erosion and Sediment	Issue #8 – Wildlife Monitoring Report	MBCA, MBR, SARA

Control Plan, and other plans; - Adaptive management measures that were implemented, if any.		
Wildlife data collected will be provided to GNWT ENR for entry into WMIS or to Environment Canada, Yellowknife.	Issue #8 – Wildlife Monitoring Report	MBCA, MBR, SARA
Types of Mitigation for Caribou		
Types of mitigation measures that the Developer will integrate into the Project design, construction, and anticipated future operational practices to reduce or minimize potential impacts of the proposed Highway on caribou are: -Limiting blasting activities, if required, to borrow sites and will only occur when caribou are >500 m from the blast site; -Working with agencies such as the HTCs, WMAC, and GNWT ENR to develop guidelines for periodic Highway closures, if required, as a way of minimizing the disruption of migration patterns to barren-ground caribou; -All sightings of caribou will be reported to environmental staff on-site; -Caribou sightings will be recorded (including a GPS location if possible) and be submitted to the GNWT DOT Planning, Policy and Environmental Division and GNWT ENR upon completion of construction; and -Caribou crossing signs will be placed along the Highway, as needed.	Species under territorial management	SARA provisions apply to boreal woodland caribou
In October 2011, GWNT ENR and GNWT DOT will undertake a grizzly bear den survey for the proposed Highway alignment and key potential borrow sources. This survey will be repeated in fall 2012 as a pre-construction denning survey.	Species under territorial management	
Types of mitigation measures that the Developer will integrate into the Project design, construction, and anticipated future operational practices to reduce or minimize potential impacts of the proposed Highway on grizzly bears and furbearers include: -Freshly dug dens will be mapped such that construction activities will avoid active dens during the hibernation period; -If possible, no activities will occur within 500 m of an active den during the denning period (October to April); and -No blasting will occur if active bear dens are confirmed within 500 m of a proposed blasting are -Maintaining a minimum distance of 500 m between identified grizzly bear/wolverine den sites and personnel during construction; -Dens (grizzly bear, wolverine) discovered within 500 m of the Highway after the pre-construction survey will be reported immediately to GNWT ENR to determine the appropriate course of action; -Providing the wildlife monitor and designated, trained staff access to non-lethal deterrent materials (e.g., bear spray). The use of any deterrent method on wildlife will be reported to GNWT ENR; -Minimizing and properly disposing of wildlife attractants such as garbage, food wastes, and other edible and aromatic substances; -Storing all food, grease, oils, fuels, and garbage in bear/wolverine-proof containers and/or areas; -Transporting waste to Tuktoyaktuk and/or Inuvik municipal solid waste facilities for disposal. Disposal of wastes at these facilities will follow the specified terms and conditions for use.	Species under territorial management	
Types of Mitigation Measures for Birds		
Types of mitigation measures that the Developer will integrate into the Project design, construction, and anticipated future operational practices to reduce or minimize potential impacts of the proposed Highway on birds include: -Conducting pre-disturbance bird nest surveys in June-July to	Issue #9 - Mitigation Measures for Birds	MBCA, MBR, SARA

document use by nesting birds; -Avoiding conducting Project activities within 500 m of an active raptor nest during nesting season; -Designing structures in a way that limits or prevents their potential use as nesting structures; and -Allowing nesting birds who have utilized structures to remain in place.		
Types of Mitigation Measures for Peregrine Falcons		
If a peregrine falcon nest is found in the future GNWT ENR will be contacted to determine any appropriate management actions required.	Species under territorial management	SARA
Types of Mitigation Measures for Bird Species at Risk		
The Developer will incorporate additional mitigation measures for bird Species at Risk including: -Immediately contacting appropriate federal (EC) and territorial (GNWT ENR) authorities if a nest of a key bird species is identified within predetermined set-back distances (as determined through consultation with EC/ENR. - Recording observations of species at risk that occur outside of the predetermined setback, and providing the observations in the annual construction monitoring report.	Issue #9 - Mitigation Measures for Birds Issue #8 – Wildlife Monitoring Report	SARA (Note MBCA and MBR provisions also apply to species at risk that are considered migratory birds under the MBCA)
WASTE MANAGEMENT		
The Developer will develop a waste management plan for all wastes associated with pre-construction and construction activities. The waste management plan will apply to the Developer and all associated Project contractors involved in the generation, treatment, transferring, receiving, and disposal of waste materials for the Project.		CEPA
The Developer commits to the following steps prior to disposal of waste: -Obtaining approval from the Town of Inuvik and Hamlet of Tuktoyaktuk to use their sewage lagoon and solid waste disposal facilities; -Providing an estimate of the amount and type of domestic waste generated by the Project compared to the facility's available capacity; -Following all applicable Licence, Permits, and/or municipal bylaws regarding the use of the facility in Inuvik and Tuktoyaktuk; and -Recording the amount of domestic waste shipped to the landfills.		CEPA
The Developer will develop and implement a hazardous waste management plan (HWMP). The HWMP will encompass all pre-construction and construction phases of the Project and will apply to the Developer and all Project contractors involved in receiving, transferring, and transporting hazardous waste for the Developer's activities on land, water, and air.		CEPA
FUEL MANAGEMENT		
The Developer commits to storing fuel used for borrow source and Highway construction activities in double-walled fuel storage tanks, and in accordance with CCME guidelines and the CEPA *Storage Tank System for Petroleum Products and Allied Petroleum Products Regulations*.	Issue #3 – Storage Tank Systems	CEPA
All vehicles and equipment will be refueled at least 100 m from water bodies following INAC (DIAND) fuel storage guidelines.		FA PPP
WATER QUALITY AND QUANTITY		
The Developer will conform to Section 36(3) of the Fisheries Act, prohibiting the deposit of a deleterious substance through implementation of erosion and sediment control measures.		FA PPP

The Developer will minimize effects to water quality and quantity as a result of Highway design: - through the design and use of crossing structures that are appropriate for site-specific flow conditions; - by employing erosion and sediment control best management practices and DFO Operational Statements (where possible) as per approved Environmental Management Plans; - installing appropriately sized culverts to divert and manage Highway and surface drainage flows; and - undertaking primary Highway embankment construction activities during the winter months.		FA PPP
The Developer will provide a copy of the Erosion and Sediment Control Plan to Environment Canada for review.		FA PPP
Some of the mitigation measures for water quality and quantity effects the Developer will follow include: -Limiting the use of construction equipment to the immediate footprint of the Highway or borrow source; -Minimizing vegetation removal and conducting progressive reclamation at the clear-span abutments, culvert installations, and borrow sources; -Keeping ice bridge and ice road surfaces free from soils and fine gravel that may be tracked out by vehicles; -Avoiding the use of heavy equipment in streams or on stream banks during summer months, and the adherence to the DFO Operational Statement for Temporary Stream Crossings (DFO 2008), where this is deemed necessary; -Implementing the erosion and sediment control plan to be developed as part of the overall EMP; -Appropriately sizing and installing culverts based on hydrological assessments and local experience, to avoid backwatering and washouts. -Completing Highway embankment construction during winter months; -Adhering to the DFO Operational Statement for Clear-Span Bridges for all applicable activities; -Implementing appropriate dust control measures to minimize effects to waterbodies and aquatic habitat; -Following the DFO Operational Statement for Culvert Maintenance (DFO 2010) where necessary; -Maintaining equipment away from waterbodies; and -Adhering to spill contingency plans, as required, in a timely manner		FA PPP
STREAM CROSSINGS		
The Developer will conform to Section 36(3) of the Fisheries Act, prohibiting the deposit of a deleterious substance through implementation of erosion and sediment control measures.		FA PPP
The Developer will provide a copy of the Erosion and Sediment Control Plan to Environment Canada for review.		FA PPP
The Developer will ensure that when crossings are completed, disturbed materials will be replaced with similar-sized substrates and the bed and banks of the watercourse are stabilized and restored.		FA PPP
The Developer will conform with applicable ambient air quality objectives by using pollution prevention measures and best management practices.		CEPA
Mitigation measures for air quality during the construction phase will include: -Applying water as per the GNWT's Guideline for Dust Suppression (GNWT 1998) during summer months; -To the extent possible, aggregate stockpiling activities will be	Issue #6 - Incineration	CEPA

conducted well downwind of potentially sensitive receptors (based on prevailing winds); -Closing and progressively reclaiming borrow pits as soon as they are no longer required to reduce potential fugitive dust; -Ensuring proper maintenance of heavy equipment to minimize air emissions; and -Restricting speed limits along the access roads and Highway during construction to minimize dust production.		
NOISE		
The Developer will consult with experts and appropriate regulatory agencies, as needed, to minimize noise effects on wildlife, migratory birds, and species at risk, particularly during blasting activities.	Issue #10 – Indirect Habitat Loss for Migratory Birds	MBCA, MBR, SARA
Blasting activities, if required, will be timed to avoid periods when sensitive wildlife species are in the area.	Issue #7 – Wildlife Management Plan	MBCA, SARA
MONITORING		
An annual construction monitoring report will be provided to applicable regulators and interested parties that will include: - Encounters and mortalities; - Notifications provided to workers regarding wildlife presence; - Waste management practices - Measures used to reduce disturbance to any nesting birds; - Dust control effectiveness; - Conformance with the Wildlife Management Plan, Environmental Management Plan, Erosion and Sediment Control Plan, and other plans; - Adaptive management measures that were implemented, if any.	General Issue #8 – Wildlife Monitoring Report	MBCA, MBR, SARA
The Developer requires that Project contractors employ an adaptive management approach to ensuring sensitive species/ species at risk are adequately protected during all phases of construction.	Issue #7 – Wildlife Management Plan Issue #8 – Wildlife Monitoring Report Issue #9 – Mitigation Measures for Birds	MBCA, MBR, SARA
The Developer is committed to hiring environmental monitors to ensure the application of prescribed mitigation, identify unforeseen and potential erosion sites that could lead to the discharge of sediment to surface or groundwater, and prevent erosion and subsequent sedimentation.		FA PPP
Compliance and effects monitoring activities will be conducted to ensure the terms and conditions set out in regulatory approvals, licences and permits, the EMP, and in the commitments are met, and to check the effectiveness of mitigation measures in avoiding or minimizing potential effects.	Issue #7 – Wildlife Management Plan	MBCA, MBR, SARA
The Developer will prepare an effects monitoring table and an inspection table prior to construction. The effects monitoring table will describe the indicators and parameters to be monitored and the target or management goal. The inspections table will describe the types of inspections required, the frequency of the inspections, and which phase of the Project the inspection will occur.	Issue #7 – Wildlife Management Plan	MBCA, MBR, SARA
Environmental and wildlife monitoring will be carried out by third party monitors supplied by the ILA (environmental monitors) and the HTC (wildlife monitors), and will be funded by the Developer and/or Developer's contractor(s).	General	
The Developer will conduct post-construction monitoring according to the extent, frequency and duration required by regulators to evaluate the success of mitigation measures and to identify required modifications, repairs, or maintenance.	General	

The Developer will require that Project contractors work closely with the environmental and wildlife monitors during construction.	Issue #7 – Wildlife Management Plan	MBCA, MBR, SARA
The Developer is committed to participating with other parties in a cumulative effects monitoring program.	Cumulative Effects Issue #12 - Cumulative Effects Assessment for Species at Risk	 SARA
The Developer is committed to work closely with the ILA, the Tuktoyaktuk and Inuvik Hunters and Trappers Committees (HTCs); the Wildlife Management Advisory Committee (WMAC), the Fisheries Joint Management Committee (FJMC), the GNWT Department of Environment and Natural Resources (ENR), and selected environmental consultants to monitor environmental conditions and to validate conformance with the mitigation measures contained in the various environmental protection plans, licenses and permits that will be issued for the Highway construction project.	Issue #7 – Wildlife Management Plan	MBCA, MBR, SARA