HAMLET OF TUKTOYAKTUK, TOWN OF INUVIK
GOVERNMENT OF NORTHWEST TERRITORIES

ADDENDUM TO THE ENVIRONMENTAL IMPACT STATEMENT FOR CONSTRUCTION OF THE INUVIK TO TUKTOYAKTUK HIGHWAY, NWT





ADDENDUM

AUGUST 2011
ISSUED FOR USE
EIRB FILE NO.: 02/10-05
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KIGGIAK - EBA

Hamlet of Tuktoyaktuk, Town of Inuvik,
Government of Northwest Territories

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ADDENDUM TO ENVIRONMENTAL IMPACT STATEMENT FOR CONSTRUCTION OF THE INUVIK TO TUKTOYAKTUK HIGHWAY, NWT

EIRB FILE NO. 02/10-05

August 2011

Developer Response to EIRB Conformity Review.docx

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TABLE OF CONTENTS

PAGE

TABLES

FIGURES

PHOTOGRAPHS

1.0 INTRODUCTION

This addendum is provided to the Environmental Impact Review Board (EIRB) in response to the EIRB's letter dated July 15, 2011: *Conformity Statement and Board Direction Regarding the Draft Environmental Impact Statement for the Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories* [02/10-05]. This conformity statement provides specific direction from the EIRB to the Developer regarding the results of the conformity analysis and identifies two categories of information that require additional information:

Category 3: Specific Critical Information Deficiencies – where information deficiencies on items were identified and were considered to be of a critical nature, the Review Board determined this information would be required prior to starting the technical review phase.

Category 2: Specific Non-Critical Information Deficiencies – where information deficiencies on items were identified, but were considered to be non-critical, the Review Board determined that these concerns could be addressed during the technical review phase and no further information is required at this time.

The Developer (Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT Department of Transportation) is pleased to provide responses to both the Category 3 and Category 2 deficiencies in the following sections. The information is provided as an addendum to the EIS. The EIRB's information deficiencies are responded to in the order they appear in the EIRB's letter (July 15, 2011).

2.0 CATEGORY 3: SPECIFIC CRITICAL INFORMATION DEFICIENCIES

According to the EIRB, a critical information deficiency was identified when information the EIRB considered critical to inform the technical review phase was not provided in the Environmental Impact Statement (EIS). The nature of the critical deficiency may be either that information was lacking altogether, or was not provided in sufficient detail for some or all of the identified components listed in the EIS Terms of Reference.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
1	5.5	Regulatory approvals and non-regulatory requirements, including land-tenure	Missing CEAA process, AANDC land tenure process and land use and quarry permits required for borrow sites.

Developer's Response:

The Developer has fully revised Section 1.5 to accommodate the requested information. To ensure adequacy of the description of the *Inuvialuit Final Agreement* and CEAA environmental assessment processes as well as future regulatory and tenure requirements, the Developer received the assistance of a number of federal departments which reviewed

and provided improvements. The following section serves to replace Section 1.5 of the draft EIS.

1.5 REGULATORY APPROVALS AND NON-REGULATORY REQUIREMENTS

Through the *Inuvialuit Final Agreement* (*IFA*), signed in 1984, the Inuvialuit received title to approximately 20% of surface lands in the Inuvialuit Settlement Region (ISR), some of which includes ownership of subsurface minerals. The remaining lands are federal Crown lands administered by Aboriginal Affairs and Northern Development Canada (AANDC, formerly Indian and Northern Affairs Canada) under the *Territorial Lands Act* and regulations.

The proposed Highway will be approximately 137 kilometres (km) long and will be located entirely within the ISR. Approximately 71 km or 51.5% of the alignment will be located on Inuvialuit private lands, which are regulated and administered by the Inuvialuit Lands Administration (ILA). Approximately 67 km or 48.5% of the route will be located on Crown lands, which are regulated and administered by AANDC. The Highway and right-of-way will eventually become Commissioner's land administered by GNWT DOT under the *Public Highways Act* and other relevant federal or territorial legislation including the *Transportation of Dangerous Goods Act*.

The *IFA*, and its enabling legislation, the *Western Arctic (Inuvialuit) Claims Settlement Act,* require:

> *"…the screening of developments of consequence to the Inuvialuit Settlement Region… that are likely to have a negative impact on the environment, or on present or future wildlife harvesting. It provides for the establishment of the EISC to carry out the preliminary environmental screening of onshore developments."*
>
> (EISC 2004 p.2)

In the fall of 2009, the Project Team consulted the Environmental Impact Screening Committee (EISC), ILA, territorial and federal regulatory agencies with the goal of identifying key issues related to the proposed Highway. Regulatory and resource management agency representatives were asked to describe their organization's anticipated role in screening the proposed Project and to suggest other agencies and organizations that should be consulted. A Project Description Report was prepared in accordance with the *Environmental Impact Screening Committee – Operating Guidelines and Procedures* (EISC 2004).

After a review of the Project Description Report in April 2010, with regard to *IFA* Subsections 11(17) and 11(18), the EISC determined the proposed development could have a significant negative environmental impact and referred the project to the Environmental Impact Review Board (EIRB) for further review.

The proposed Project also falls within the scope of the *Comprehensive Study Regulations* established under the *Canadian Environmental Assessment Act (CEAA).* On September 27, 2010, the Minister of Environment referred the project to a panel review and announced that the federal review process would be a substituted review by the EIRB process.

The EIRB and Canadian Environmental Assessment Agency issued a Memorandum of Understanding entitled *Agreement to Establish a Substituted Panel for the Inuvik to Tuktoyaktuk Highway Project* on March 2, 2011. The environmental assessment conducted by the EIRB must meet the requirements of the *IFA* and *CEAA*.

Upon review of the project, if the EIRB concludes that significant negative effects can be mitigated to an acceptable level and the Project may proceed, two federal government decisions will be required before any permits and licences may be issued. Under the *IFA*, the competent government authorities will make a decision with respect to the EIRB's recommendation, while under *CEAA*, the Governor-in-Council will also make a decision with respect to the EIRB's recommendation.

Following the issuance of the necessary decisions, the ILA and applicable federal and territorial regulatory agencies can issue permits and licences with appropriate terms and conditions.

Figures 1.5-1 and 1.5-2 show the location of the proposed Highway in the context of the Mackenzie Delta area. Figure 1.5-2 identifies the jurisdictional boundaries that indicate which agencies will permit, licence, or otherwise issue decisions and authorizations for the construction of the Highway and associated activities.

1.5.1 Previous Regulatory Approvals

Previous approvals known to have been obtained for road construction and/or quarrying in the Project area are described below.

In 2000, the ILA granted an approval to E. Gruben's Transport Ltd. (EGT) to remove approximately 30,000 cubic metres (m^3) of aggregate material from Source 177. Some of this material was placed on several kilometres of land in the vicinity of the proposed alignment, some of which is now part of the all-weather Tuktoyaktuk to Source 177 Access Road.

In 2009, the ILA granted approval to the Hamlet of Tuktoyaktuk and the GNWT Department of Transportation to construct the all-weather Tuktoyaktuk to Source 177 Access Road. The road was completed in 2010.

Other land use and quarry permits have been issued in the Inuvik to Tuktoyaktuk corridor, but they pre-date the *IFA* and the current environmental screening and regulatory regime. Notably, borrow sources were accessed by Gulf Canada Ltd. in the 1970s to create spring/summer well site leases at the Parsons Lake natural gas field west of the proposed Highway alignment. As well, Source 168 was quarried by E. Gruben's Transport Ltd. (EGT) in the 1980s for shoreline erosion protection for the community of Tuktoyaktuk.

1.5.2 Review and Approvals Processes

There are several aspects of the proposed Highway project that require changes in land tenure and regulatory authorizations. The proposed Highway traverses private Inuvialuit lands and Crown lands. It crosses over a number of watercourses. During some phases of construction, the project will require considerable volumes of water and the extraction of large quantities of borrow resources. Regulatory authorizations required for a variety of Project activities are described below.

1.5.2.1 Inuvialuit Land Administration Authorizations

Access to Inuvialuit lands requires permission from the ILA. The ILA issues rights to access both 7(1)(a) and 7(1)(b) lands (ILA 2009, IRC 1987). For the portions of the proposed development activities occurring on privately held parcels, the ILA will be the primary regulatory authority.

ILA Regulatory Authorizations

The GNWT and the Inuvialuit Regional Corporation (IRC) achieved an agreement in 2007 entitled *GNWT Access and Use of Inuvialuit Private Lands*. This agreement covers a variety of access situations that includes temporary winter roads but does not include permanent all-weather highways. The agreement requires negotiation of environmental inspections prior to construction on ILA lands.

The Developer anticipates securing multi-year authorizations from the ILA to accommodate the duration of Highway construction. Granular resource requirements for the Highway will be met using material from selected borrow sources located in the vicinity of the Highway alignment. The required authorizations identified during consultations with the ILA include: a Temporary Right-of-Way, a Land Use Permit, and combined Land Use Permit and Quarry Permits for borrow sources. Supplemental geotechnical and biophysical studies will be conducted to fulfill the requirements of the land use and quarry applications. The ILA's Pits and Quarries Guidelines will be followed.

Land Tenure

Negotiations are underway to transfer the portion of the Highway right-of-way on Inuvialuit owned lands to the authority of the GNWT as a public highway following the procedure set out in the *Inuvialuit Final Agreement*. Once transferred, the public highway will fall under the *Public Highways Act* administered by the GNWT DOT.

The Developer anticipates continuing dialogue with the ILA and other Inuvialuit organizations and authorities. These discussions will include interpretation of Project terms and conditions, and completion of agreements under negotiation.

1.5.2.2 Aboriginal Affairs and Northern Development Canada Authorizations

Aboriginal Affairs and Northern Development Canada (AANDC), under the *Territorial Lands Act*, the *Territorial Lands Regulations*, the *Territorial Land Use Regulations*, and the *Territorial Quarrying Regulations,* holds jurisdiction and administration of land use activities on Crown lands in the Inuvialuit Settlement Region.

AANDC Regulatory Authorizations

The Developer anticipates securing multi-year authorizations from AANDC to accommodate the duration of Highway construction. A land use permit will be required for the proposed Highway right-of-way, temporary borrow source access roads, borrow source sites and temporary camps occurring on Crown lands. Specifically, under the *Territorial Land Use Regulations*, a Class A Land Use Permit will be required to carry on any work or undertaking that involves the levelling, grading, clearing cutting or snowploughing of any line, trail or right-of-way exceeding 1.5 m in width and exceeding 4 ha in area.

Granular resource requirements for the Highway will be met using material from selected borrow sources located in the vicinity of the Highway alignment. The Project will require quarry permits issued under the *Territorial Quarrying Regulations* for the extraction of borrow materials. AANDC will consider requested volumes in the context of the resource requirements of other reasonably foreseeable community, industrial, and other demands for granular resources. At present, AANDC permits borrow sources for a maximum duration of one year; therefore, successive annual permits may be required.

Applicable application forms will be submitted for the Land Use Permits and Quarry Permits. Supplemental geotechnical and biophysical studies will be conducted as necessary to fulfill the requirements of the land use and quarry applications. AANDC's Northern Land Use Guideline series: Roads and Trails, Pits and Quarries, and Camps and Support Facilities will be followed.

Land Tenure

The *Northwest Territories Act* provides the Commissioner with the administration and control of all roads on public lands. Specifically, under Section 44 (2) of the *Act,* the GNWT DOT will obtain tenure for the Highway right-of-way on federal Crown lands, once construction is completed. To formally transfer title, the Highway must be surveyed and subsequently, the Commissioner of the Northwest Territories registers the survey and title and sends out a notification of such registration.

Discussions are underway to transfer the portion of the Highway right-of-way on Crown land to the authority of the GNWT as a public highway once it is constructed. Once transferred, the public highway will fall under the *Public Highways Act* administered by the GNWT DOT.

1.5.2.3 Northwest Territories Water Board Water Licensing

According to *Northwest Territories Waters Act* Section 12, the Northwest Territories Water Board (NWTWB) is responsible to provide for the conservation, development and utilization of waters in the Inuvialuit Settlement Region. The Developer will require a Type A and/or Type B water licences for water use, water crossings, and construction camps.

The thresholds for water licences under the *Northwest Territories Waters Regulations* include:

- A Type A Water Licence is required for the direct use of 300 m^3 or more of water per day for industrial use. The construction of the proposed Highway is anticipated to use 1,000 m^3 or more of water per day during peak phases of construction, particularly when establishing temporary winter access roads and for dust control in summer months. Under the *Northwest Territories Waters Act* Subsection 174(1), it is mandatory for the NWTWB to provide the opportunity for a public hearing for projects that require a Type A Water Licence.
- A Type B Water Licence is required for the construction of a structure across a watercourse that is greater than five metres wide at the ordinary high water mark at point of construction. The proposed highway crosses more than one watercourse greater than five metres in width.
- A Type B Water Licence is required for camps of more than 50 persons. The proposed Project requires a number of 15-20-person camps in the first year, and in the second year, at least one camp of greater than 50 persons may be added.

The EIS provides information about water crossings greater than five metres in width, identifies the need for crew accommodations, and provides a construction schedule and preliminary logistics plan. The detailed water requirement estimates, water source identification, construction camp siting, and the location of winter access and haul roads will be submitted in the regulatory applications.

The Project Team will conduct further assessment of the proposed water crossing locations in summer 2011 and will provide information about watercourse characteristics and proposed crossing structure designs sufficient to meet the requirements of the *Northwest Territories Waters Regulations* and the DFO (2005) *Protocol for Winter Water Withdrawal from Ice-Covered Waterbodies in the Northwest Territories and Nunavut*. DFO's water withdrawal protocol provides guidance to proponents on how to mitigate impacts to fish and fish habitat during water withdrawals from ice-covered waterbodies. Baseline information, as described in the protocol, must be gathered before the protocol is applicable. This will include identification of suitable water withdrawal sources (lakes and streams), bathymetric surveys, assessment of allowable withdrawal quantities per source, unique source identification, and water withdrawal volume tracking.

1.5.2.4 Fisheries and Oceans Canada Authorizations

Fisheries and Oceans Canada (DFO) administers the *Fisheries Act*, which includes habitat protection provisions that relate to the Highway Project and associated activities. These provisions include:

- Section 22 (1) requires that sufficient flow be maintained for passage of fish;
- Section 30 requires that fish guards or screens be places on water intakes;
- Section 32 prohibits the killing of fish by means other than fishing, unless authorized by the Minister; and
- Section 35 (1) prohibits the harmful alteration, disruption of destruction of fish habitat, (2) unless authorized by the Minister.

Project activities or structures that result in the harmful alteration, disruption or destruction (HADD) fish habitat will require an Authorization. The installation of a culvert on a stream may be considered a HADD. This Authorization recognizes that a HADD is likely to occur, and includes measures to be followed by the proponent and the requirement for compensation as outlined under DFO's No Net Loss (NNL) policy.

DFO may issue a Letter of Advice for components of the Project that are not expected to result in a HADD and will set out or refer to guidelines and/or mitigation measures that, if followed, should prevent a HADD.

In addition, DFO has developed a series of Operational Statements that provide guidance to project proponents regarding specific types of works or activities. The intention of these Operational Statements is to relieve proponents of the need for an approval from DFO, provided that specified requirements and conditions are followed. In the Northwest Territories, DFO has the following Operational Statements: clear-span bridges, culvert maintenance, ice bridges and snow fills, temporary stream crossings, and maintenance of riparian vegetation in existing rights-of-way.

DFO's Operational Statements state conditions under which it is applicable to a project. An Operational Statement cannot be partially followed; all measures must be followed in order to avoid negative effects to fish habitat and maintaining fish passage. If an Operational Statement cannot be fully followed, a Letter of Advice or Authorization may be given.

The proposed Highway will be sited and designed to avoid or mitigate adverse effects on fish and fish habitat (i.e. HADD) for the various stream crossings. As such, it is expected that most of the Project can be completed through the issuance of Letters of Advice by DFO, or by application of relevant Operational Statements. Where a HADD is unavoidable, the Developer will provide sufficient information for the purpose of the authorization and will develop suitable compensation strategies.

DFO requires that a habitat assessment be done at all locations requiring an Authorization. Where Authorizations may not be required, details on the use of Operational Statements and commitment to ensuring that they are being applied correctly must be provided to DFO. The required field studies were partially undertaken in 2010 and will be completed in summer 2011. DFO will also require information on how flow will be maintained at all crossings and if a watercourse may be indirect fish habitat.

1.5.2.5 Permit for Construction within Navigable Waters

The Navigable Waters Protection Program (NWPP), implemented by Transport Canada, ensures the public's right to navigate Canada's waters without obstruction through the administration of the *Navigable Waters Protection Act* (NWPA). To avoid or minimize the impact to navigation, the NWPP ensures that works constructed in navigable waterways are reviewed and regulated for works built in, on, over, under, through or across navigable water in Canada prior to their construction. For this Project, the construction of works involving navigable waterbodies will likely require *NWPA* Approvals and Transport Canada NWPP will be responsible for issuing any Approvals under the *Act*.

Recently, Transport Canada has established a two-stage review process, Initial and Secondary Review, to be used by proponents in determining whether or not a particular navigable water meets the definition of a minor navigable water. The NWPP (2010) *Minor Waters User Guide* aids in assessing navigability of the proposed waterways. The criteria for each class of water, established in the *Minor Works and Waters (NWPA) Order* and referenced in the *Minor Waters User Guide* (NWPP 2010), must be fully met in order for the navigable water to be considered "minor" under the provisions of the *NWPA*.

Once an application has been submitted, the NWPP will complete a Navigability Impact Assessment for the identified waterway(s). It is possible that some of the larger streams in the Husky Lakes area, in particular Hans Creek and Zed creek may constitute navigable waters. Detailed applications in accordance with the requirements established by the NWPP will be compiled once the applicable bridge design information becomes available. Related site information on watercourse crossing width, depth and grade as well as photographs will be available following the 2011 field studies.

1.5.2.6 Research Authorizations

Pre-construction studies will include additional environmental, engineering, and archaeological investigations. Scientific activities, except for wildlife research and archaeological surveys, are administered under the *Scientists Act* and are permitted with the issuance of a Scientific Research Licence by the Aurora Research Institute.

Wildlife Research Permits are issued by the GNWT Department of Environment and Natural Resources (ENR).

Several permits will be required from the federal Department of Fisheries and Oceans including Scientific Collection Permits and Animal Use Permits.

Archaeological investigations are permitted under the *Northwest Territories Archaeological Sites Regulations* made under the *Northwest Territories Act.* A Class 2 Permit is issued to the archaeologist undertaking the archaeological survey by the Prince of Wales Northern Heritage Centre. The regulations also specify reporting requirements.

Research authorizations will be obtained on an annual basis, as needed, prior to the conduct of seasonal field activities. Most research applications will require screening by the EISC. Local Hunters and Trappers Committees (HTCs) and Community Corporations will be notified of proposed work activities as the project progresses.

1.5.2.7 Non-Regulatory Requirements

Non-regulatory requirements are typically advice provided by local organizations, such as the HTCs, Community Corporations, or the general public. During the consultations undertaken, the Developer took note of comments and concerns, and incorporated these in the Highway planning process to the extent possible.

References:

Canadian Environmental Assessment Agency. 2010, December. Notice of Approval: Substitution for Review Panel Process, Inuvik to Tuktoyaktuk Highway Project. Retrieved March 1, 2011.

Environmental Impact Review Board and Canadian Environmental Assessment Agency. March 2, 2011. Agreement to Establish a Substituted Panel for the Inuvik to Tuktoyaktuk Highway Project.

Inuvialuit Regional Corporation and Government of the Northwest Territories (IRC and GNWT). 2007. Agreement entitled "GNWT Access and Use of Inuvialuit Private Lands".

Transport Canada. 2010. 2010 Minor Waters User Guide.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
2	5.6	Study strategy and methodology: • Identified where guidelines and best practices have been used • Identification of any modifications to guidelines and best practices used	The Best Management Practices and Guidelines that were and will be used are not clearly identified, and it is not identified whether any modifications were proposed. Some DFO Guidelines mentioned no longer apply or are out of date (see specific DFO comments).

Developer's Response:

The Developer acknowledges that all of the guidelines and best practices identified throughout the EIS are not identified in the introductory Section 1.6 (Study Strategy and Methodology). The Developer has reviewed the EIS and prepared a consolidation of the

list of guidelines and best practice documents cited throughout the EIS (Table 1). To assist reviewers, the table provides the page reference of each time a document is cited. In addition, the Developer has provided more specific details on a best practice manual identified in the EIS that is nearing completion.

Should the Developer require the use of explosives, any planned activities will be reviewed by DFO during the construction phase to ensure appropriate best practices are followed. The current guideline (*Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters*) and the additional two publications cited by DFO will be followed as appropriate. These are included as sources of best practices for this activity.

The Developer has also provided additional source documents that were under development. For example, GNWT DOT contracted Dillon Consulting Ltd. (Dillon) to prepare an erosion and sediment control best practices / mitigation techniques document for the specific environmental requirements of typical GNWT DOT earthwork-type projects. The resource material provided to Dillon included DFO's best practices from various "working near water" documents and a nationally accepted guide authored by the Transportation Association of Canada (TAC 2005) entitled *National Guide to Erosion and Sediment Control on Roadway Projects.* The expert review is expected to be completed by October 2011, and, once final revisions are completed, will become a standard guidance document for application in GNWT DOT contracts including this Project. The new guidance document is referenced in Table F and pages 469 and 507 of the EIS.

TABLE 1: CONSOLIDATED LIST OF GUIDELINES AND BEST PRACTICES FOR CONSTRUCTION AND OPERATIONS

Title	Source	EIS References	Changes?
Environmental Policy (Draft)	GNWT DOT 2010 (to be finalized 2011)		New guidance
Guidelines for Development and Management of Transportation Infrastructure in Permafrost Regions	Transportation Association of Canada. 2010	Table 6.1, Table F, 63, 85, 644	No change
Environmental Guidelines for the Construction, Maintenance, and Closure of Winter Roads in the Northwest Territories.	GNWT DOT 1993 (Stanley Associates Engineering Ltd. and Sentar Consultants Ltd.)	Table F, 492	No change
Highway Maintenance Manual	GNWT DOT 1993	Table F, 492	No changes
Environmental Best Practices for Erosion and Sediment Control: A Manual for Transportation Maintenance and Construction (DRAFT)	GNWT DOT 2011 (Dillon Consulting Limited)	Table F, 469, 507	New guidance

TABLE 1: CONSOLIDATED LIST OF GUIDELINES AND BEST PRACTICES FOR CONSTRUCTION AND OPERATIONS			
Title	**Source**	**EIS References**	**Changes?**
Guideline for Dust Suppression	GNWT 1998	Table 6.1, T Table F, 91, 474, 481, 482, 491, 492, 503, 516, 522, 524, 541, 644	No changes
Land Development Guidelines for the Protection of Aquatic Habitat.	DFO 1993	Table 6.1, Table F, 488, 490, 492, 493, 495, 500, 507	DOT approach to culvert installation gives consideration to permafrost specific considerations.
Northern Land Use Guidelines - Access: Roads and Trails.	INAC 2010	Table 6.1, 488, 490, 500	Special consideration will be given to culvert installation techniques that are appropriate for permafrost areas.
Northern Land Use Guidelines: Camp and Support Facilities.	INAC 2011	89, 609, 610	No changes
Northern Land Use Guidelines Access: Pits and Quarries.	INAC 2010	Table 6.1, 63, 85, 501	No changes
ISR Granular Resources Management Plan Section 3: Pits and Quarries Guidelines	ILA and INAC 2010	63, 85, 501	No changes
Canadian Water Quality Guidelines for the Protection of Aquatic Life: Summary Table.	CCME 2007	Table 6.1	No changes
Freshwater Intake End-of-Pipe Fish Screen Guidelines	DFO 1995	502	No changes
Protocol for Winter Water Withdrawal from Ice-covered Waterbodies in the Northwest Territories and Nunavut	DFO 2005 (revised June 21, 2010)	Table 6.1, Table F, 88, 491, 493, 497, 502	No changes
Temporary Stream Crossing. NWT Operational Statement. Version 1.0	DFO 2008	Table 6.1 Table F, 492	No changes
In-Water Construction Timing Windows for the Protection of Fish Habitat. NWT Operational Statement. Version 3.0	DFO 2009	Table F	No changes
Clear Span Bridges. NWT Operational Statement. Version 3.0	DFO 2009	Table F, 489, 493, 497, 498, 507	No changes
Culvert Maintenance. Operational Statement. Version 3.0.	DFO 2010	Table 6.1, Table F?, 490, 493, 497, 498, 499, 500, 507	No changes

TABLE 1: CONSOLIDATED LIST OF GUIDELINES AND BEST PRACTICES FOR CONSTRUCTION AND OPERATIONS			
Title	**Source**	**EIS References**	**Changes?**
A Guide to Spill Contingency Planning and Reporting Regulations	GNWT ENR 2011	674	No changes
Guidelines for Spill Contingency Planning	INAC 2007	Table F (says 1987), 458, 610	No changes
Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products.	CCME 2003	90, 609	No changes
Guideline for the General Management of Hazardous Waste in the NWT	GNWT RWED 1998	612	No changes
Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters	DFO 1998 (Wright, and. Hopky)	Table 6.1, Table F, 486, 497, 501	Standards for explosives have been updated with regards to the NWT. All operations involving explosives near waterbodies will be reviewed by DFO
Monitoring Explosive-Based Winter Seismic Exploration in Water Bodies NWT 2000 - 2002.	Cott and Hanna 2005		Activities involving explosives near waterbodies will be reviewed by DFO.
Discussion on Seismic Exploration in the Northwest Territories 2000–2003	Cott, Hanna and Dahl 2003		Activities involving explosives near waterbodies will be reviewed by DFO.
Guidelines for Developers for the Protection of Archaeological Sites in the Northwest Territories.	PWNHC ND	Not in Table 6-1	No changes
A Field Guide to Ice Construction Safety	GNWT DOT 2007	86	No changes
Bear Safety Guidelines	GNWT RWED 1998	Table F, 534	No changes

The list will be maintained to ensure new guidelines and best practices are incorporated throughout the EA and regulatory phase. The Developer would appreciate being informed of new guidelines or updates to existing guidelines or best practices as the project proceeds.

Addendum to EIS References:

Cott, P. and B. Hanna. 2005. Monitoring Explosive-Based Winter Seismic Exploration in Water Bodies NWT 2000-2002. In Offshore Oil and Gas Environmental Effects Monitoring: Approaches and Technologies / edited by Armsworthy, Shelley, Peter J. Cranford, Kenneth Lee.

Cott, P., B. Hanna and J. Dahl. 2003. Discussion on Seismic Exploration in the Northwest Territories 2000-2003. Canadian Manuscript Report for Fisheries and Aquatic Sciences 2648.

Dane, B.G. 1978. Culvert Guidelines: Recommendations for the design and installation of culverts in British Columbia to avoid conflicts with anadromous fish. Department of Fisheries and Environment, Pacific Region, Fisheries and Marine Service Technical Report No. 811. http://www.dfo-mpo.gc.ca/Library/59380.pdf

Dillon Consulting Limited. 2011 (DRAFT). Environmental Best Practices for Erosion and Sediment Control: A Manual for Transportation Maintenance and Construction. Report in preparation for Government of the Northwest Territories Department of Transportation.

GNWT Resources Wildlife and Economic Development (RWED). February 1998. Guideline for the General Management of Hazardous Waste in the NWT. Retrieved from http://www.enr.gov.nt.ca/_live/documents/content/General_management.pdf

GNWT Resources Wildlife and Economic Development (RWED). Bear Safety Guidelines.

Inuvialuit Land Administration and Indian and Northern Affairs Canada (ILA and INAC). 2010. Inuvialuit Settlement Region Granular Resources Management Plan.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
3	5.6.5	Precautionary Principle • Has the Developer used the precautionary principle in its decision-making process?	Instances where the Precautionary Principle was applied, and why it was applied, have not been identified or explained.

Developer's Response:

The Developer's approach to applying the precautionary principle is described in Section 1.6.5 (Precautionary Principle) of the EIS[1]. As stated in this section, the precautionary principle is an approach to risk management that reflects the need to take prudent action in the face of potentially serious risk without having to await the completion of further

[1] In order to protect the environment and human health, *Canadian Environmental Protection Act* (1999) defines the precautionary principle as, where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation, and promotes and reinforces enforceable pollution prevention approaches.

scientific research. This principle implies that there is a social responsibility to protect the public and the environment from exposure to harm, when scientific investigation has found a plausible risk. These protections can be relaxed only if further scientific findings emerge that provide sound evidence that no harm will result.

The precautionary principle was employed throughout the project design and effects assessment through the consistent application of best management practices, applicable guidelines, mitigation measures, and protective policies as fundamental principles. These principles are part of the Developer's operational practices and environmental policy.

Specific examples of the application of the precautionary principle during Highway design include:

- Proposing to construct the Highway embankment during winter to minimize impacts on terrain, permafrost, vegetation cover, fish habitat and barren-ground caribou;
- Proposing to install single-span bridges over major fish-bearing streams; and
- Proposing route alignments outside of the Husky Lakes 1 km setback to minimize or avoid potential social and cultural effects.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
4	6.1	Route alignment alternatives • Information provided on the preferred alignment? • Information provided on any alternative alignments or portions of alignments?	General information was provided; however, the Developer appears to support some of the new alignment options that were included, but does not provide specific biophysical information about them.

Developer's Response:

Section 2.1.2 (Alignments Considered in the Current Stage of Project Development) of the EIS discusses the Primary Alignment and the various minor re-alignments proposed in the Husky Lakes area. Included in that section is a description of Alternative 3, the 2010 Minor Realignment, recommended by Inuvialuit interests to modify Alternative 1 (2009 Minor Realignment) and to provide a more direct route. This information was presented to the Developer just prior to submission of the Project Description Report, and is identified as an option in this EIS.

As stated in this section, the Developer considers this alternative alignment in the Husky Lakes area to be a promising route option, but the engineering considerations related to this option in the field have yet to be assessed. However, the Developer feels that subject to Project approval and additional field study data, Alternative 3 would be further considered and likely adopted in the detailed design stage (Figure 1).

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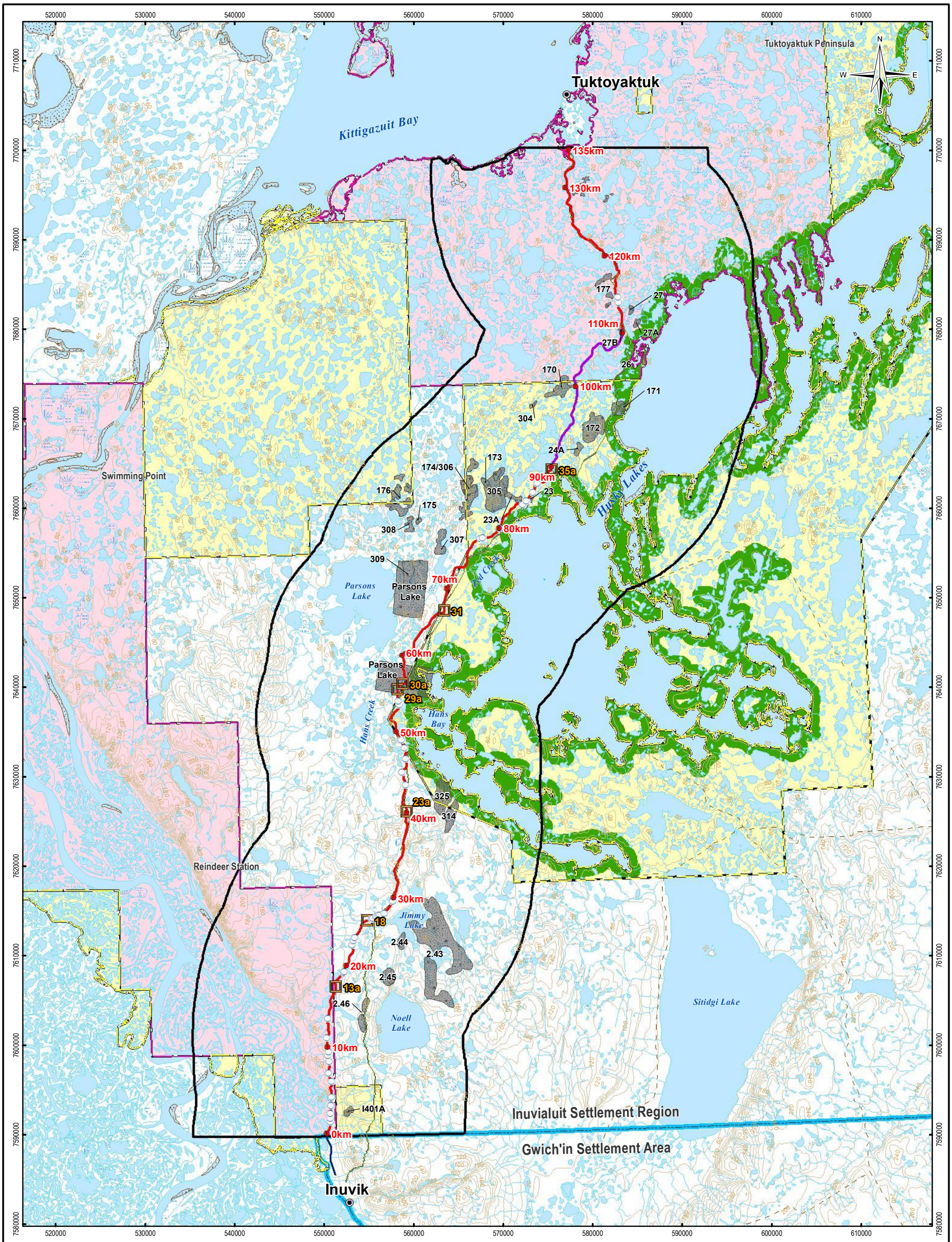


LEGEND

- Stream Crossing
- Stream Crossing - Potential Bridge
- Regional Study Area (15 km buffer)
- Preferred Route
- Alternative 3 (2010 Minor Realignment)
- PWC 1977
- Navy Road
- Inuvialuit 7(1)(a) Lands
- Inuvialuit 7(1)(b) Lands
- Gwich'in / Inuvialuit Boundary
- Borrow Sources
- Husky Lakes 1000m Setback
- Trail
- Contour
- Watercourse
- Waterbody
- Wetland
- Sand

NOTES

Base data source: NTS 1:250,000

Borrow Sources, ILA Lands, Husky Lakes 1000m Setback: Inuvialuit Land Administration

ISSUED FOR USE

PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY

2009 Route with Alternative 3 (2010 Minor Realignment)

PROJECTION: UTM Zone 8	DATUM: NAD83		
Scale: 1:400,000 (5 2.5 0 5 10 Kilometres)			
FILE NO.: V23201322_EIRB_Map001_Alignment.mxd			
PROJECT NO.: V23201322	DWN: KW	CKD: TS	REV: 2
OFFICE: EBA-VANC	DATE: August 19, 2011		

Figure 1

The Developer acknowledges that the preferred alignment of the Primary 2009 route warrants clarification. Thus for the Technical Review, the Developer would recommend that the Primary 2009 route, with incorporation of the Alternative 3 minor realignment, as shown in Figure 1, be considered as the preferred route for the proposed Highway.

A revised Section 2.7.7 (Recent Studies Completed and Additional Field Studies Required) of the EIS submitted in response to Category 3 Conformity Request #5 outlines the additional baseline data collection programs.

This new information will assist in refining the Highway alignment and Highway design, confirming the selection of borrow sources, and designing the most appropriate crossing structures (bridges and culverts) for each of the streams present in the section(s) of Highway to be constructed during the initial winter construction season.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
5	6.3	Development phases and schedule • Workforce requirements for all phases • Responsibilities of governments and other agencies for all phases • Development costs for all phases • Identification and description of any new work and additional field studies to be conducted	Does not include a discussion of additional field work planned for 2011, how this information would apply to the EIS, or how the environmental impact review process would benefit.

Developer's Response:

Section 2.7 (Development Phases and Schedule) of the EIS discusses the schedule of Project activities to be undertaken, generally on an annual basis, during the anticipated four years of Highway construction. Table 2.7.2-1 of the EIS was based on the premise that annual biophysical (e.g., rare plant, wildlife and fish), archaeological, and engineering surveys would be conducted to support the permitting requirements for each upcoming year of construction work.

The Developer has reconsidered this approach and initiated a significant program of studies for 2011 and 2012, as described in Table 2. Preliminary information from the proposed 2011 field studies is expected to be available by the end of September 2011. Final reports will be available by late November or early December 2011 depending on the topic. Some additional reports are expected by late summer 2012.

TABLE 2: PROPOSED BASELINE DATA COLLECTION PROGRAMS		
Program	**Type of Work**	**Proposed Timing**
Aerial Photography	1:10,000 scale photos taken Draft prints ready Final Digital prints Ortho-Photo Mapping	July 25 – 28, 2011 August 16, 2011 August 31, 2011 September 2011
LiDAR Survey	Placement of Ground Control and Capture	August 15 – 20, 2011
Terrain and Geotechnical	Field Assessment	August 29 – September 2, 2011
Traditional Knowledge/ Traditional Land Use	Conduct workshop	October 2011
Fisheries	Fish Habitat Assessment	August 22 – September 23, 2011
Archaeology	Impact Assessment	August 22 – September 23, 2011
Vegetation Baseline	Vegetation Sampling Rare Plant Field Work	June – July 2012
Wildlife and Wildlife Habitat	Grizzly Bear Den Survey Spring Waterfowl Staging Survey (aerial) Waterfowl Breeding Survey (aerial) Raptor Nest Survey (aerial) Breeding Bird Survey (passerines/shorebirds)	October 2011 May 2012 June 2012 June 2012 June / July 2012

Additional future field studies will be required for detailed engineering and regulatory applications once the initial environmental assessment is completed. These are identified in this conformity response.

The Developer has fully revised Section 2.7.7 (Recent Studies Completed and Additional Field Studies Required) of the EIS to accommodate the requested conformity information and to provide details on the information being collected. The following conformity response serves to replace Section 2.7.7 of the draft EIS.

2.7.7 Recent Studies Completed and Additional Field Studies Required

The Developer has initiated activities that are required, including detailed engineering, regulatory applications, effects monitoring, and construction and operations plan development. The following subsections describe the activity and schedule for these activities.

2.7.7.1 Surveying and Engineering

In July 2011, the GNWT DOT obtained 1:10,000 scale photography of the road alignment and borrow sources. GNWT DOT has prepared an orthophoto mosaic of the Project. This imagery will be provided to consultants undertaking additional engineering and field surveys.

In August 2011, the GNWT DOT obtained LiDAR (Light Detection And Ranging) imagery for all potential routings. LiDAR analysis will be completed in September 2011.

Additional engineering studies for the proposed route alignment will be undertaken in 2012 including right of way surveying and bridge design.

2.7.7.2 Terrain Baseline and Borrow Source Geotechnical Studies

In 2011, GNWT DOT undertook reconnaissance of key potential borrow sources along the proposed route. This included determining pit boundaries, survey data and limited shallow borrow pit sampling by hand shovelling. Potential borrow sources assessed included those on Crown lands (Sources 1401A, 2.46, 2.45, 2.43, 3.25 (portion outside of Husky Lakes setback), Parsons Lake (portion west of Highway alignment only), 309, and 307) and those on Inuvialuit lands (Sources 173/305, 174/306, 172, 170, 27B, and 177). Information obtained will be used to support Land Use Permit applications for winter geotechnical drilling, sampling and lab testing.

In 2011, a contract was issued to Kavik-Axys Inc. (Kavik-Axys) to conduct a terrain baseline study along the proposed Highway alignment. Surface material, surface expression, drainage, slopes and geomorphic processes will be mapped using a combination of recently acquired stereo digital imagery and Kavik-Axys' High Definition Mapping and APPlications (HD-MAPP) system.

Kavik-Axys will conduct a reconnaissance program to complete site investigations of landforms, terrain stability, permafrost conditions, presence of waterbodies, and identification of access road stream crossings, as well as hydrological factors which may affect access or extraction activities. A final baseline report is expected by August 31, 2012.

Mapping will occur at a representative scale of 1:7,500 but will be reproduced at 1:20,000. This will include the identification, delineation and classification of surficial geology, ice-rich deposits and terrain-related geohazards. This will assist in the planning of a comprehensive geotechnical investigations program to be conducted in 2012 and 2013 including winter geotechnical drilling, sampling and lab testing to confirm the quantity and quality of materials, and delineate the source prior to finalizing Pit Development Plans and to assist with detailed engineering and design.

2.7.7.3 Traditional Knowledge / Traditional Land Use Study

In 2011, a contract was issued to Kavik-Axys to conduct a Traditional Knowledge / Traditional Land Use study in consultation with the Hunters and Trappers Committees, the Elders Committees and the Community Corporations in Inuvik and Tuktoyaktuk. The study methods include: a review of existing traditional knowledge and traditional land use information; and workshops in Inuvik and Tuktoyaktuk with community members to collect site specific traditional knowledge and traditional land use information for the local study area (LSA).

Information to be obtained on the traditional Inuvialuit use of the lands within the study area will include:

- types of traditional land use activities that took place and/or are currently taking place, in the LSA;
- species-specific ecological knowledge and environmental knowledge of the land and species, to enhance and be integrated with information collected for biophysical studies including habitat features, denning areas, nesting areas, and species life histories and use of the area;
- issues or concerns regarding the potential effects of the project and development on wildlife, wildlife habitat and community health and wellness (both physical and social);
- site-specific locations of any traditionally used sites including, but not limited to camps, kill sites, graves, travel routes, berry or plant collecting areas, and fishing and hunting areas, spiritual sites; and
- Traditional environmental knowledge regarding wildlife (birds, fish, mammals) and other aspects of the environment. Subjects to be covered include wildlife migration routes, breeding and feeding areas, overwintering areas, population trends, or other changes observed in the ecosystem over time.

The literature review will be completed by September 2011 and workshops will follow in October 2011. Analysis and review by communities will occur during January and February 2012 with a final report available by April 30, 2012.

2.7.7.4 Fish and Fish Habitat Studies

Since the Project Description Report was completed in February 2010, additional field work was completed for fish and fish habitat in June 2010. The studies included detailed analysis of fish presence, habitat features, water quality, and hydrology for the first 25 km north of Inuvik and the first 25 km south of Granular Source 177. The study methodology and results were provided in the draft EIS Appendix C: Spring 2010 Aquatic Field Program Results for the Inuvik to Tuktoyaktuk Highway, Northwest Territories.

In 2011, a contract was issued to IMG-Golder Corporation (IMG-Golder) to complete fish and fish habitat studies for the remaining portion of the proposed Highway alignment. Field work will occur between August 22 and September 23, 2011. Work will include the identification of areas that potentially support fish resources such as migration, spawning and juvenile fish rearing areas. Most potentially impacted watercourses will be assessed by walking along the shoreline, only minor waterbodies (possibly seasonal in nature) will be assessed through aerial photographs taken from the helicopter. Habitat will be characterized (e.g., channel widths, water velocity, bed material, in-situ water chemistry, etc.). Shoreline characteristics, such as substrate type, vegetation, and gradient, will be recorded and photos will be taken of representative or particular features. Draft reports,

including mitigation measures, will be available by October 26, 2011 and a final report will be issued by mid-December 2011.

As part of the 2011 work, a Fishery Compensation Plan will be completed for all watercourses where crossings are likely to result in the harmful alteration, disruption or destruction of fish habitat.

In 2012, additional fish habitat assessments will be undertaken for the proposed Highway alignment selected as required. This will be determined in discussions with DFO during the regulatory phase.

2.7.7.5 Archaeology Studies

In 2009, Points West Heritage Consulting Ltd. prepared an archaeological overview assessment of the proposed highway and selected borrow sources. Borrow sources south of Hans Creek were not assessed. The overview assessment primarily focused on the identification of specific portions of the project components likely requiring future ground surveys.

In 2011, contracts were issued to IMG-Golder to complete an archaeological assessment of the proposed Highway alignment. Field work will be conducted between August 22 and September 23, 2011 of areas of high and moderate archaeological potential and extended areas around known and potential archaeological sites along the proposed Highway alignment. Potential borrow sites investigated in 2011 will also be surveyed. Potential impacts to archaeological resources will be identified. An assessment of archaeological sites potentially impacted will be provided to the Prince of Wales Northern Heritage Centre to determine adequacy of mitigation measures. A draft report will be available by October 23, 2011.

In 2012, additional archaeological assessments will be undertaken as required. This will be determined in discussion with the Prince of Wales Northern Heritage Centre.

2.7.7.6 Vegetation Baseline Studies

In 2011, a contract was issued to Kavik-Axys to conduct a field-based vegetation and rare plant studies program for the proposed Highway alignment and proposed borrow sources. In August to September 2011, Kavik-Axys will prepare a preliminary vegetation cover type map for a 1 km corridor centered on the route alignment and for borrow sources. This will be followed by a vegetation cover sampling survey (in conjunction with terrain surveys) in fall 2011. The sampling survey will confirm the vegetation mapping of the EIS based on the field sampling by IOL (2004). This vegetation cover sampling survey will be conducted in fall 2011 (coordinated with terrain/geotechnical surveys).

In 2012, a highly-targeted rare plant survey will be conducted in summer (coordinated with wildlife surveys).

A final baseline report is expected in August 31, 2012 including a map and report describing the density and distribution of vegetation cover types, and summarize rare plant and uncommon vegetation occurrence. Wetlands will be summarized as part of the vegetation cover types. As appropriate, the IOL (2004) vegetation cover types will be amended. Vegetation cover type mapping will be applied to 2012 wildlife habitat mapping.

2.7.7.7 Wildlife/Wildlife Habitat Baseline Studies

In 2011, a contract was issued to Kavik-Axys to conduct a field-based wildlife and wildlife habitat studies program for the proposed Highway alignment and potential borrow sources, which includes:

- An assessment of habitat potential of the LSA (i.e. 500 m on either side of the centerline) along the identified alignments and borrow source sites by:
  - Characterizing habitat features; and
  - Inventorying habitat features and resident species.
- Identification of wildlife, bird and plant species that are known or suspected to use the LSA for any stage of life cycle activities.

Wildlife and wildlife habitat field surveys will be conducted in spring 2012 as outlined in Table 3.

TABLE 3: PROPOSED WILDLIFE AND WILDLIFE HABITAT FIELD SURVEYS

Program	Type of Work	Proposed Timing
Spring Waterfowl Staging Survey (Aerial)	• Identification and mapping of wetlands/lakes with large numbers of staging migratory bird (waterfowl) staging areas within the LSA. (Aerial survey transects to be determined in consultation with EC).	May 2012 (5 days)
Waterfowl Breeding Survey (Aerial)	• Identification and mapping of potential forage/nesting/rearing areas for waterbirds/waterfowl staging areas within the LSA. (Aerial survey transects to be determined in consultation with EC).	June 2012 (5 days)
Breeding Bird (Passerines/ Shorebirds)	• Identification and distribution of migratory breeding birds and habitat. • Breeding bird point counts (passerines) and 400 x 400 m plots (shorebirds) will be placed throughout the LSA to assess a variety of habitats for breeding potential. (Locations/design to be determined in consultation with EC). • Information will assist in determination of habitat capability of key species or groups.	June 2012 (5 days)

TABLE 3: PROPOSED WILDLIFE AND WILDLIFE HABITAT FIELD SURVEYS		
Program	**Type of Work**	**Proposed Timing**
Wildlife Sign	• Additional wildlife sign will be recorded including: – Incidental species observations; – Game trails, tracks, scat/pellets; – Nests, dens (active and historic); and – Vegetation characteristics (e.g. browse species).]	2012
Habitat Ranking	• During all surveys during the growing season, biologists will assess the habitat potential for key species of management concern. • All information will be used to develop habitat rankings that will be used to map habitat capability (based on availability of browse, denning and nesting material/sites, shelter and cover) in the LSA.	2012

A final baseline report is expected in August 31, 2012 including:

- A list of species surveyed;
- Location, description and assessment of habitat features;
- An assessment of habitat capability;
- A discussion of the occurrence of species of special concern or sensitivity;
- Identification of tracks and spoor;
- A description of specific life cycle activities of species within the LSA and at borrow sites;
- A description of trees and shrubs;
- A description of ground cover, including forbs, graminoids, lichens, mosses, leaf litter, etc;
- A description of observed browsing species;
- Location and description of raptor nests, migratory bird areas, pellet clusters, stick or cavity nests, and other avian breeding or staging locations;
- Identification of potential forage, nesting or rearing areas for waterbirds; and
- A description of game trails, traplines or obvious ungulate pastures.

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.

In June to July 2012, GNWT ENR and GNWT DOT will undertake a raptor survey for the proposed Highway alignment and potential borrow sources.

2.7.7.8 Navigable waters identification

Key parameters to identify navigable waters will be collected during fisheries studies in 2011.

Site specific navigable waters information will be finalized as part of the authorization applications in 2012.

2.7.7.9 Additional Field Studies Required

Pre-construction wildlife surveys to be conducted include:

- Pre-disturbance surveys for critical wildlife habitat features (e.g., dens, nests) will be conducted in cooperation with GNWT ENR prior to construction, as required.
- Pre-disturbance bird nest surveys in June-July to document use by nesting birds will be conducted in consultation with Environment Canada.

Hydrological assessments will be conducted prior to bridge design to determine suitable span widths and abutment placement.

Water source studies to be conducted in summer 2012 include:

- Identification of suitable water withdrawal sources (lakes and streams);
- Bathymetric mapping of proposed water sources; and
- Assessment of allowable withdrawal quantities per source, unique source identification, and water withdrawal volume tracking.

2.7.7.10 Additional Plans Required For Construction

The Developer has committed to the preparation of an Environmental Management Plan (EMP) prior to construction. Certain component plans will be submitted for regulatory approval. The EMP will clearly define expectations for compliance monitoring, responsibilities, requirements for training, and reporting.

The EMP will contain the following types of plans:

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 as part of fish and fish habitat protection planning. This plan will be completed by September 2012.

Fish and Fish Habitat Protection Plan - The Developer will develop and implement a fish and fish habitat protection plan in consultation with DFO that will include mitigation measures and adherence to Operational Statements or other direction by DFO. These will be completed by September 2012 or as specified by the regulator.

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, Environmental Canada, WMAC, and HTCs. This will be completed by September 2012.

Archaeological Site(s) Protection Plan - The Developer will prepare an archaeological site(s) protection plan to facilitate the continued protection and management of archaeological resources during the construction phase of the Project. This will be completed by October 2012.

Pit Development Plan – The Developer will provide pit development plans to the ILA and AANDC as part of the quarry permitting process. Site specific pit developments plans will be phased over three years ahead of each year of construction. The first plans will be completed by August 2012.

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. These will be completed by September 2012 or as specified by the regulator.

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. These will be completed by September 2012 or as specified by the regulator.

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) three months prior to the start of construction (i.e. October 2012).

Health and Safety Plan - The Developer commits to ensuring that its contractor(s) have Health, Safety and Environment (HSE) manuals; work procedures documents; and site-specific health and safety plans. The Developer or its contractor(s) will develop Project-specific Bear Safety Guidelines and will educate staff accordingly including the proper use of non-lethal wildlife deterrent materials (e.g., bear spray).

2.7.7.11 Additional Plans Required For Operations

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 focus will be on operational guidelines and procedures relevant to the mandate of GNWT DOT. The EMP will include guidelines and public education related to Highway usage and monitoring of highway user activities.

In addition, the Developer anticipates developing a post-construction monitoring plan in consultation with or directed by regulators to evaluate the success of mitigation measures and to identify required modifications, repairs, or maintenance.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
6	6.4	Life of the project • Information about the expected life of the project at all phases • Other party information (see 6.3 as well)	Does not discuss any long-term management responsibilities of the Hamlet of Tuktoyaktuk or the Town of Inuvik (if any), or how the overall objectives of the various levels of Government are met by developing this highway.

Developer's Response:

As indicated in Section 2.7.5 (Roles and Responsibilities) of the EIS, the Developers or Project Team for the proposed Inuvik to Tuktoyaktuk Highway are the Hamlet of Tuktoyaktuk, the Town of Inuvik and the GNWT Department of Transportation. The Hamlet of Tuktoyaktuk and Town of Inuvik provide political and administrative support for the Project, particularly during the permitting process. During the construction phase, GNWT DOT will coordinate with these communities regarding matters such as water supply and waste management.

The GNWT DOT is responsible for the design and construction of the Highway, including field studies, data collection, and future funding, similar to other NWT highways. Typically, construction, operation and maintenance activities are contracted to local and regional businesses.

Section 1.3 (Development Purpose and Justification) of the EIS summarizes the range of local, regional and national benefits achieved through construction of the Highway. These benefits translate into the ultimate goals and objectives of the territorial and federal government of increasing employment, improving the nation's infrastructure, and developing capacity. This is reflected in the Government of Canada and Government of the Northwest Territories' continued interest in the Project (since the 1970s) and current funding commitments.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
7	7.1	Alternative means of carrying out the project • Description(s) • Identification of environmental effects of alternatives • Criteria and rationale for preferred option	Discussion needs to include alternative means and methods.

Developer's Response:

Alternative means and methods for carrying out the construction of the proposed Highway are not specifically discussed in a particular section of the EIS. However, alternative means and methods considered are discussed in various sections of the EIS, including the Executive Summary, Section 1.2 (Development Overview), Section 2.2.5 (Technical Factors), Section 2.6.2 (Winter Season Construction), throughout Section 4.2 (Biophysical Components) and Section 4.5 (Effects of the Environment on the Project).

Important construction considerations are:

Placement of Frozen Fill over the Frozen Tundra versus Use of Cut and Fill Techniques

To protect the permafrost terrain along the proposed Highway alignment, typical 'cut and fill' techniques commonly employed in southern areas of the Northwest Territories and elsewhere will NOT be used for this Project. Such traditional construction methods cut into protective layers of surface vegetation and organics, with the possible result of significant damage to the terrain and thawing of the permafrost. Therefore, the current design involves the placement of frozen fill materials directly onto the frozen surface of the tundra along the Highway alignment.

Winter Construction versus Summer Construction

Another fundamental tenet of the Highway construction method is to complete most of the construction activities during the winter months rather than more typical summer construction, as used in southern Canada.

The advantages of winter construction are:

- Allows the use of temporary ice/winter access to borrow sources, without the need to construct all-weather access roads.
- Allows the placement of construction material directly onto frozen ground. This approach enables the establishment of a frozen core for the Highway and helps protect sensitive and ice-rich terrain.
- Minimizes potential effects on vegetation and soil from construction equipment that might occur if working in snow-free, thawed, or wet conditions.

- Promotes initial Highway stability through the placement of frozen borrow material directly onto frozen ground (with geotextile separation layer).

Following each year of winter construction, it is anticipated that most embankment settlement will occur in the top layers of the emplaced borrow material as it thaws, dries and consolidates. Little to no thaw is expected in the lower layers of the embankment, leading to greater Highway stability. This is also expected to reduce potential longer term maintenance problems.

Important elements of the Highway design are:

Embankment Design

The embankment design specifies fill thicknesses (heights) based on terrain type. A minimum embankment (or fill) height of 1.4 m will be required to construct the Highway using ice-poor granular materials. Granular materials which are low in fine particles, less than 0.02 mm, will be used to reduce the potential for frost heave or seasonal thaw settlement. This will be sufficient to protect the permafrost layer below the Highway surface.

Employing a standard fill thickness, particularly fill thicknesses lower than those specified for the construction of highways in permafrost areas would likely result in significant negative effects on the integrity of the permafrost layer below the Highway surface.

Application of Geotextile Fabric

Geotextiles typically perform two functions – separation and reinforcement (TAC 2010). The use of non-woven geotextile fabric between the existing ground and placed construction material (separation) serves to assist in maintaining the integrity of the Highway embankment. The reinforcement function assists in restricting embankment spreading over the softer surface terrain that will occur annually along the toe of the Highway embankment, which will be subject to annual freeze and thaw cycles within the active layer.

Culvert Design

Culverts should be sized generously (two to three times the size that would be used in non-permafrost areas) to compensate for design uncertainties, ice, snow and sediment blockage, and subsequent settlement. Alternatively, the use of frequent small culverts will be considered, where appropriate, instead of accumulating large flows by using large-diameter culverts.

Culvert wall thickness in permafrost regions should be greater than the wall thickness of culverts in non-permafrost regions to account for loss of lateral restraint due to thawing permafrost foundation in soils and winter icing or frost heave. These factors can impose secondary loads. The GNWT DOT specifies a 2.8 mm wall thickness for all culverts up to 1,200 mm diameter, regardless of fill height.

Reference:

Transportation Association of Canada (TAC). June 2010. Guidelines for Development and Management of Transportation Infrastructure in Permafrost Regions.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
8	7.2	Alternative route options • Description of each option • Criteria and rationale for selection of preferred option	General information was provided; however, the Developer appears to support some of the new alignment options that were included, but does not provide specific biophysical information about them. Also need to include comparison discussions about the geometric features of each considered option, including mitigation options (where required) and associated costs.

Developer's Response:

The multiple accounts analysis that is presented in the EIS compares the Primary Alignment, Alternative 1 and Alternative 2 based on various factors, one of which is geometric features. Specific features that are considered include length of highway, number of and tightness of horizontal curves, height of embankment, steepness of hills and number of hills that have a grade that is steeper than what is desired for comfortable travel. The information or data for the specific features is a product of the preliminary design that was conducted in the preparation of the Project Description Report and the origins of the preliminary design are in the outcome of the field assessments for the specific alignments.

The EIS indicates that Alternative 3 (2010 Minor Realignment recommended by Inuvialuit interests; Figure 1) is a promising route option and will likely be adopted in the detailed design stage based on additional information to be gathered in future survey, geotechnical and other investigations. In the meantime, a relative comparison of Alternative 3 and the other options shows the following:

- The terrain, topography and number/shape of waterbodies along Alternative 3 are similar to the Primary Alignment and Alternative 1 and, overall, is shorter in distance by 2 km (as compared to the Primary Alignment). It is anticipated then, that the preliminary design for Alternative 3 would be similar or even more favourable than the Primary Alignment and Alternative 1 with respect to curves, hills, and height of embankment.
- The same is anticipated for other factors and sub- indicators (i.e., cost of construction and cost of operation, impact to quality of life, etc.) described in the EIS for comparison of the alignments.

More specific biophysical information on the alternate minor realignments, particularly Alternative 3, currently obtained and the key results will be provided by the Developer during the Technical Review phase of the EIRB Review Process.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
9	8.2.2	Temporal boundaries identified	It is not clear whether the timeframe used to assess effects to biophysical and human environment components includes the anticipated long-term operation phase of the highway.

Developer's Response:

Section 2.8 (Life of the Project) of the EIS states that "the Highway is intended for permanent, long-term use." The Developer decided not to attempt to define what was meant by the terms "permanent, long-term use", but it is reasonable to assume that the Highway, once constructed would continue to exist and operate for the foreseeable future – at least the next 100 years. The biophysical and socio-economic effects assessment is based on the anticipated long-term (as described previously) operations phase of the Highway.

The rationale for selecting the 10 year temporal timeframe for the cumulative effects assessment portion of the EIS is that it includes a reasonable number of years that spans both the construction (four years) and initial operation (six years) of the Highway. This timeframe also recognizes a basic assumption of cumulative effects assessment that the other projects or activities considered should include those projects or activities that are currently under regulatory review, or are reasonably likely to occur and are not hypothetical.

The outer limit of the temporal timeframe selected could conceivably have been extended to 20 years or more, but this was not considered to be necessary or appropriate as the assessment would need to have extended into the realm of hypothetical projects, and baseline environmental parameters (such as future fish and wildlife population cycles) will likely have changed in a currently unpredictable manner.

The 45 year timeframe referenced in Section 4.3.2 (Regional and Local Economies) of the EIS is cited from an independent economic analysis commissioned by the GNWT DOT (2010a) entitled *Inuvik to Tuktoyaktuk All-Weather Road Economic Analysis*. This report is presented in its entirety in Appendix F of the EIS. For the purpose of their economic analyses, the authors of the report assumed a 45-year life for the Highway, corresponding to the 45-year life of the Mackenzie Gas Project used by the Joint Review Panel assessment.

Reference:

Government of the Northwest Territories, Department of Transportation, Planning Division (GNWT DOT). 2010a, June 8. Inuvik to Tuktoyaktuk All-Weather Road Economic Analysis.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
10	9.1	Biophysical environment descriptions • Terrain, Geology, Soils and Permafrost • Climate • Air quality • Noise • Water quality and quantity • Fish and fish habitat • Wildlife and wildlife habitat • Birds and bird habitat • Vegetation	Most of the biophysical information provided in the EIS is applicable to an ecoregion level of description, and appears to have been gathered from literature reviews and may be suitable for describing the Regional Study Area, a 15km buffer on either side of the Primary 2009 Route option. Field verified, local study area biophysical information for most of the required biophysical components has not been provided. Very few field surveys appear to have been conducted in support of the EIS, and some appear to be partially or completely missing (i.e., water quality and quantity, none for vegetation communities, rare plants, harvested plants, wildlife). For those field surveys conducted, methods are not provided, with the exception of Fish and Fish Habitat, which is provided in Appendix C. The quantitative basis for any future monitoring programs is <u>not</u> apparent for most of the biophysical environment components.

Developer's Response:

The Developer agrees that much of the environmental baseline documentation provided in Section 3.0 (Existing Environment) of the EIS is of a general nature, but does present the currently available information for the Tuktoyaktuk Peninsula and the Mackenzie Delta area in the vicinity of the proposed Inuvik to Tuktoyaktuk Highway. The Developer is also of the opinion that the available information is adequate for the level of assessment conducted in the EIS.

Apart from the initial helicopter reconnaissance-level environmental, engineering, archaeology survey conducted in September 2009, the 2010 fish and fish habitat survey of the northern-most and southern-most portions of the proposed highway are the only recent field studies conducted specifically for the Project that are available for use in preparation of the EIS. Additional fish/fish habitat and archaeological field work conducted in support of the Tuktoyaktuk to Source 177 Access Road is also incorporated into the EIS as appropriate, as were the results of water quality sampling of selected streams conducted by INAC (now AANDC) in the fall of 2010. Plant community descriptions cited from IOL (2004) were based on plot sampling conducted along the gathering system right-of-way and ConocoPhillips development field at Parsons Lake.

As previously discussed in Category 3 Conformity Response #5, available preliminary information will be provided by the Developer during the Technical Review phase of the EIRB Review Process.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
11	10.1	Assessment of potential impacts: • Terrain, Geology, Soils and Permafrost • Climate • Air quality • Noise • Water quality and quantity • Species of concern • Fish and fish habitat • Wildlife and wildlife habitat • Birds and bird habitat • Vegetation • Biodiversity • Country foods	Although potential impacts are identified in an overarching sense, the EIS does not provide a quantification of impacts that would form a foundation for follow-up programs with testable questions. For example, there is no way to quantify how the road may impact wildlife locally as no field studies (i.e., winter wildlife tracking, avian surveys, etc.) have been conducted in the respective road option LSAs. The EIS does not provide commitments to when such quantification would be developed or provided. The EIS does not provide any description of confidence associated with impact predictions. Polar bears should be identified and discussed as a VEC.

Developer's Response:

Quantification of Potential Effects

The Developer appreciates that limited quantification of potential effects on most valued components (VCs), including wildlife, has been provided in the EIS but with respect, this expectation is generally not achievable as quantitative information is not typically available for the purpose of predicting possible effects of the highway on wildlife or the other VCs.

With regard to the example of wildlife, as discussed in the EIS, the main construction activities associated with the Highway will take place in the winter period when most bird species have migrated south and bears are in hibernation. The main types of wildlife expected to be active and possibly present in the vicinity of winter construction activities include caribou, foxes, wolverines and wolves. Temporary, short-term and reversible disturbance reactions are the most likely types of effects that could occur during this time. The HTC wildlife monitor(s) assigned to the construction crews will assist in advising the construction crew(s) on matters related to the presence of wildlife in the area and the possible application of mitigation measures (e.g., temporarily cease or alter construction activities) if it is judged that wildlife (in particular caribou) is in the immediate vicinity.

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. At this time the migratory bird species that frequent the area will have returned, and wildlife species in the area will be more active. Once again, temporary, short-term and reversible disturbance reactions would be the most likely types of effects that could occur during this time. In addition, dust would likely be

generated by Project activities, and would be suppressed/ managed by the application of water.

During the long-term operations period, the possibility of wildlife mortality due to collisions with vehicles, and the potential for excessive harvesting by the Inuvialuit beneficiaries or general public are expected to be the primary issues associated with the future operation of the Highway. As indicated in the EIS, to ensure that the wildlife and other environmental values of the area remain protected, users of the Highway will need to abide by any management restrictions developed for the Highway by the resource management agencies and co-management bodies in consultation with the HTCs and other interested stakeholders.

The Developer's confidence in the effects predictions that are presented in the EIS is largely based on professional judgement, and is reflected in the "Likelihood" column of the residual effects assessment matrices that accompany the assessment for each of the main VCs. This particular column is intended to provide an indication of how likely it is that a particular effect may or will occur relative to the various other defining criteria (magnitude, geographic extent, duration, frequency, reversibility).

As stated in the EIS, 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. The Developer is confident that with the application of the commitments and mitigation measures described in the EIS, that the biophysical and human environment elements and goal statements presented in Table 4-1 of the EIS (extracted from the EIRB (2010) Terms of Reference for this Project) can be achieved. The Developer anticipates that achieving these goal statements will be an important objective to assess during the Technical Review phase of the EIRB review process.

Polar Bear

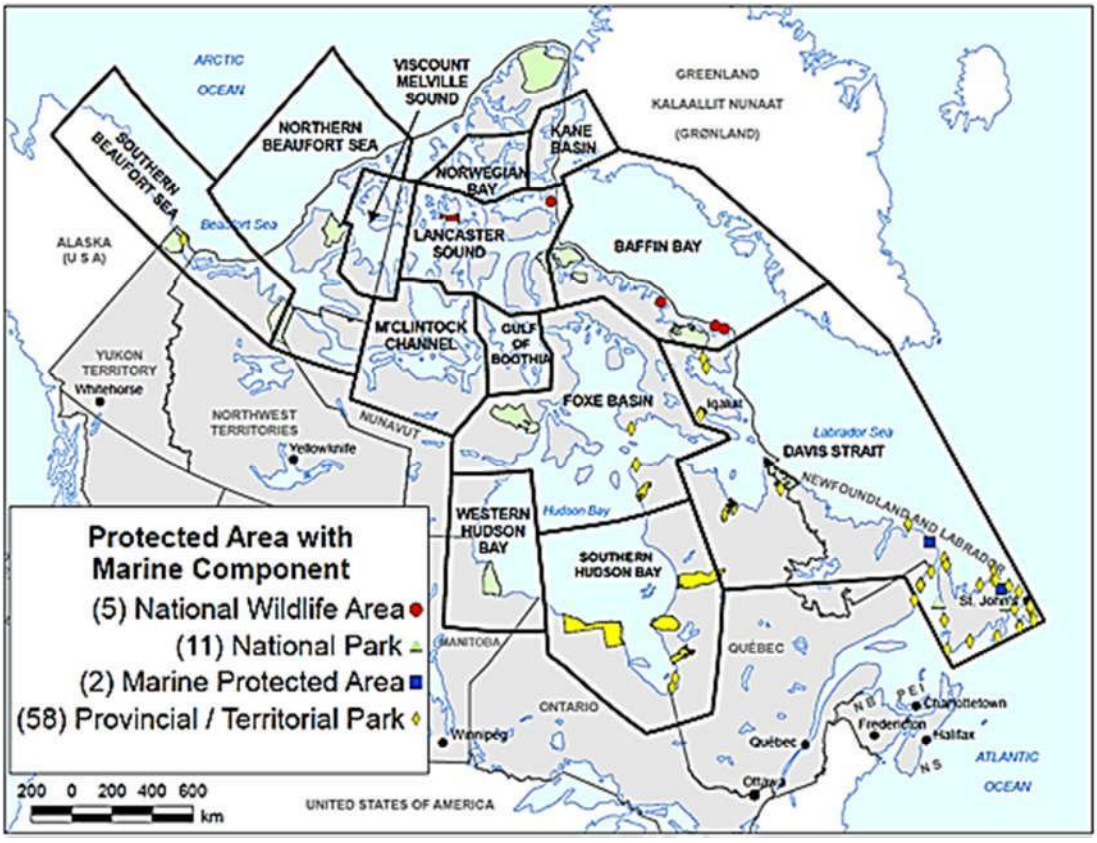
Table 3.1.9-1 in the draft EIS reflected species that might occur within the Regional Study Area based on the NWT Species Monitoring Infobase maintained by the Department of Environment and Natural Resources. Polar bears were listed but were not selected as a Valued Component (VC) as polar bears are normally associated with the marine environment and the annual offshore ice regime, and are only rarely found on the land in the vicinity of the proposed Highway corridor.

On July 2, 2011, the federal Minister of the Environment recommended the addition of polar bears to Schedule 1 of the *Species at Risk Act* (SARA) as a Species of Special Concern (Canada Gazette 2011).

The Developer is providing the following information and assessment of polar bears as a supplement to the draft EIS Section 31.9 Wildlife and Wildlife Habitat.

The polar bear (*Ursus maritimus*) has a northern circumpolar distribution and Canada is home to approximately 60% of the world's polar bear population. Currently there are approximately 15,500 polar bears in Arctic Canada, distributed in 13 sub-populations

(COSEWIC 2008). Polar bears are found mainly in the coastal regions of the Arctic Ocean in ice-covered regions from the Yukon and the Bering Sea in the West, to Newfoundland and Labrador in the East, and from Ellesmere Island, Nunavut in the north to James Bay in the south, including coastal northern Ontario and Quebec (Figure 2).



Source: Environment Canada (2011)

Figure 2: Canadian Polar Bear Subpopulations and Protected Areas

Three sub-populations are recognized in the Northwest Territories, the Southern Beaufort Sea, Northern Beaufort Sea and Viscount Melville Sound sub-populations (Figure 2). The Polar Bear Management Zones in the Inuvialuit Settlement Region are shown in Figure 3. Only the Southern Beaufort Sea sub-population could be potentially affected by the proposed Highway Project. The most recent (2006) population estimate for the Southern Beaufort Sea polar bear population is 1,526 animals) (Regehr et al. 2006).

Polar bears are generally limited to ice-covered areas for most of the year. Persistent pack ice in the offshore Beaufort Sea means that polar bears are seldom found on the delta during the open-water season (Chetkiewicz and Marshal 1998). Ice conditions are important mainly because they determine the suitability of the habitat for ringed seals, the polar bears primary prey.

LEGEND

Polar Bear Management Areas

- I/PB/01 North Beaufort
- I/PB/03 South Beaufort
- I/PB/02 Viscount Melville

NOTES

Source: Map 20. Tuktoyaktuk CCP (April 2008)

ISSUED FOR USE

Incorporated Hamlet of Tuktoyaktuk

Town of Inuvik

Northwest Territories

KIGGIAK - EBA

PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY ADDENDUM TO EIS

Polar Bear Management Zones

PROJECT NO.	DWN	CKD	REV
V23201487	SL	RH	0
OFFICE: EBA-VANC	DATE: August 19, 2011		

Figure 3

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Polar bears are also known to scavenge on the carcasses of beluga and bowhead whales, and are capable of capturing spring-migrating belugas and dragging them from openings in the pack ice (Amstrup 2003). In winter and spring, polar bears prefer offshore areas with leads, although females with cubs typically prefer landfast ice (Stirling et al. 1993). In late spring and summer, polar bears typically move north with the retreating ice.

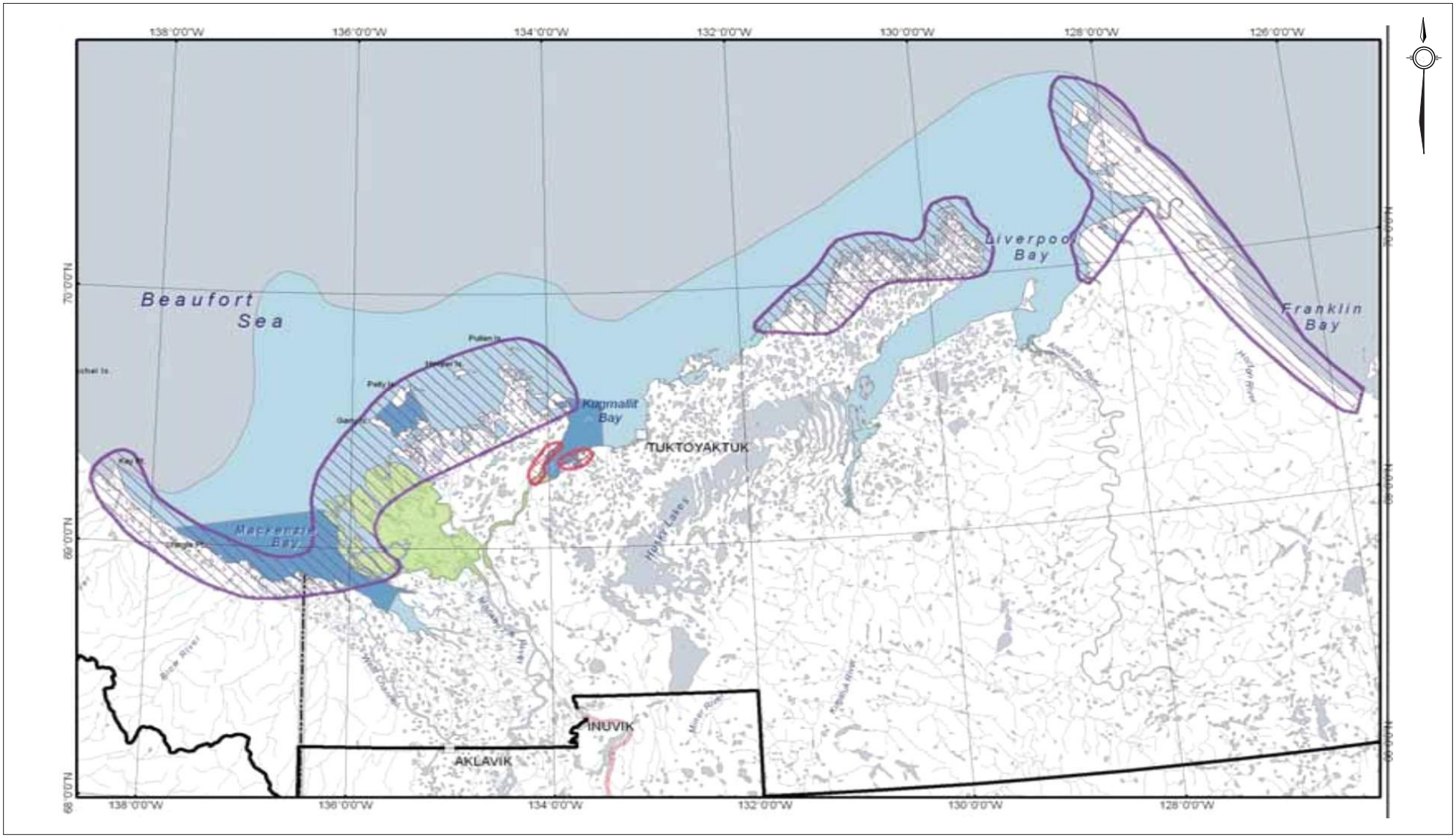
Although polar bears usually remain on the sea ice all year, some have been known to inhabit terrestrial areas for short periods (Amstrup 2000). Between 1985 and 1993, 106 adult polar bears were radio-tagged in the Beaufort Sea area. Only 144 of 11,000 satellite relocations (about 1%) occurred on land, indicating that they rarely ventured inland (Amstrup 2000).

In the Mackenzie Delta, an adult female polar bear was observed wandering on the Dempster Highway near Fort McPherson in August 2007 (Photo 1; CBC 2007). As reported by the CBC, the people in Fort McPherson were stunned to see this polar bear near their hamlet. The bear was subsequently trapped by GNWT ENR wildlife officers, driven to Inuvik and then transported by helicopter to an isolated spot on the Arctic coast.

Source: CBC 2007

Photo 1: Polar bear on the Dempster Highway near Fort McPherson, August 2007

Polar bear denning typically occurs from November to late March or early April. Birthing dens are typically located along the coast, on offshore islands, on shore-fast ice and on drifting sea ice. Females that come ashore to den and give birth; returning to the sea ice when the cubs are ready to travel (Amstrup 2003). Most maternal denning in the western Canadian Arctic is known to occur on Banks Island, and little maternal denning occurs on the mainland from east of Herschel Island (Yukon) to east of Paulatuk. However, some bears have denned in the outer Mackenzie Delta on Hooper and Pullen islands (Stirling and Andriashek 1992) and near Tent Island (Clarkson and Irish 1991). Figure 4, reproduced from the Tuktoyaktuk Community Conservation Plan (Community of Tuktoyaktuk et al. 2008) shows the coastal polar bear denning areas found on the mainland.



LEGEND

Sites in the Mackenzie Delta

- 323C Mainland Coastal Polar Bear Dens
- 711E Beluga Management Zone 1A
- 712C Beluga Management Zone 2
- 718D Central Mackenzie Delta
- 729E Kittigaaryuit

0 10 20 40 60 80 100
Kilometers

NOTES

Source: Map 11. Tuktoyaktuk CCP (April 2008)

ISSUED FOR USE

Town of Inuvik

Northwest Territories

KIGGIAK - EBA

PROPOSED INUVIK-TUKTOYAKTUK HIGHWAY ADDENDUM TO EIS

Special Designated Area 323C: Mainland Coastal Polar Bear Denning Areas

PROJECT NO.	DWN	CKD	REV
V23201487	SL	RH	0
OFFICE	DATE		
EBA-VANC	August 19, 2011		

Figure 4

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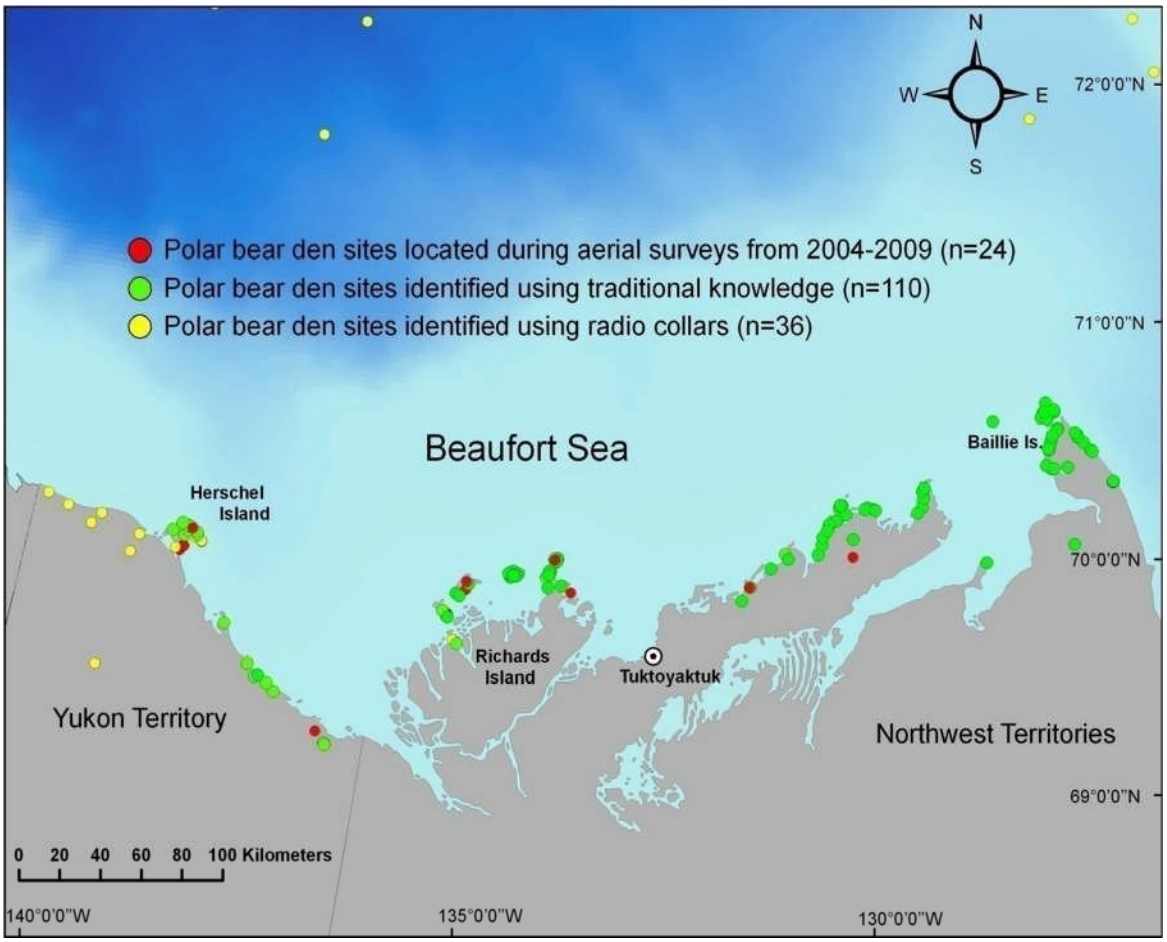
Current research does not have any denning areas identified in inland areas east of the Mackenzie River (Figure 5) (Richardson, E. July 2011, pers comm.).



Source: Richardson 2011

Figure 5: Polar Bear Denning Locations in the Beaufort Sea Region

Threats to polar bears across their entire range include climate change, changes to the populations of seals and other prey, increasing human activity, over-harvesting, problem kills, and industrial contamination.

Polar bears are an important resource to Inuvialuit people. Polar bear harvest is managed under strict quotas in the Inuvialuit Settlement Region. Harvest management is performed under the Inuvialuit-Inupiat Polar Bear Management Agreement in the Southern Beaufort, and agreements between the Inuvialuit and Kitikmeot Hunters and Trappers Committees for the bears shared in the Northern Beaufort Sea and Viscount Melville Sound.

WMAC (NWT) and the IGC set the number of tags and tag allocation. Bear tags are allocated to each community for subsistence use and the local Hunter and Trapper Committee decides how many tags can be re-assigned for sport hunting. Sport hunting is

permitted only by dog sleds and when accompanied by an Inuvialuit guide. A tag that was used for an unsuccessful sport hunt cannot be reused.

In the Inuvialuit Settlement Region, from 1988 to 1997, 20 to 63 polar bears were taken each year (average of 44/year) (Joint Secretariat 2003). Polar bear harvesting in the offshore area located within the Tuktoyaktuk Planning Area occurs mainly in March to May with occasional harvest in December to February (Community of Tuktoyaktuk et al. 2008).

The current annual harvest quota is forty (40) bears in the Southern Beaufort Sea portion of the Canadian management area. Twenty-six (26) tags are allocated to the Tuktoyaktuk HTC, three tags (3) to the Inuvik HTC, five (5) tags to the Aklavik HTC, and six (6) tags to the Paulatuk HTC. The HTCs regulate Inuvialuit harvest through bylaws. Kills of problem bears are also considered when setting the harvest quotas.

In the context of the proposed Inuvik to Tuktoyaktuk Highway, polar bears might occur on the land in the vicinity of the proposed Highway construction program on very rare occasions. The same mitigation measures that are proposed for grizzly bear would be applied in the event of a polar bear encounter.

The term a Valued Component has been reserved for key species of importance that could be affected by the Project. This assessment confirms that the species will not be directly or indirectly affected by the Project and therefore should not be a VC. However, the *SARA* assessment requirements have been met with this supplement.

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Community of Tuktoyaktuk, Wildlife Management Advisory Council and Joint Secretariat (Community of Tuktoyaktuk et al.). 2008, April. Tuktoyaktuk Community Conservation Plan: A Plan for the Conservation and Management of Natural Resources and Lands within the Inuvialuit Settlement Region in the Vicinity of Tuktoyaktuk, Northwest Territories.

Derocher, A.E., Garner, G.W., Lunn, N.J., and Wigg, O. (Eds.) (Derocher et al.). 1998. Polar Bears. Proceedings of the 12th Meeting of the IUCN Polar Bear Specialist Group. Oslo, Norway, 1997. Occas. Pap. 19. IUCN Survival Commission.

Environment Canada. 2011. Maps of Global and Canadian Sub-populations of Polar Bears and Protected Areas. Retrieved July, 2011 from http://www.ec.gc.ca/nature/default.asp?lang=En&n=F77294A3-1#_map2

Environmental Impact Review Board (EIRB). 2010, November 3. Environmental Impact Statement Terms of Reference for the Environmental Impact Review of the Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories Development Proposal.

Joint Secretariat. 2003. Inuvialuit Harvest Study Data and Methods Report 1988-1997. Inuvik, Northwest Territories.

Regehr, E.V., Amstrup, S.C., and Stirling, I. (Regehr et al.) 2006. Polar bear population status in the southern Beaufort Sea: US Geological Survey Open-file Report 2006-1337.

Richardson, E. July 2011. Unpublished Map of Den Locations. Polar Bear Research Biologist, Environment Canada.

Stirling, I., and Andriashek, D. 1992. Terrestrial maternity denning of polar bears in the eastern Beaufort Sea area. Arctic 45: 363-366.

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Stirling, I., Andriashek, D.A., and Calvert, W. (Stirling et al.). 1993. Habitat preferences of polar bears in the western Canadian Arctic in late winter and spring. Polar Record 29: 13-24.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
12	10.2	Human environment components • Demographics • Regional and local economies • Education, training and skills • Infrastructure and institutional capacity • Human health and community wellness • Socio-cultural patterns • Harvesting • Land use • Heritage resources	An economic analysis was provided in the EIS. However, for many other components (social and cultural), the discussion of potential effects lacks depth and analysis. Few links are made between the economic effects of the project, and the social and cultural effects that may result from (1) the project itself, and (2) the economic effects. Further, the absence of Traditional Knowledge (TK) and Traditional Land Use (TLU) studies presents a gap in the identification and mitigation of social and cultural effects. In many cases, parties/organizations responsible for implementing mitigation are identified, but mitigation measures are not suggested, nor are impacts to the responsible organization identified.

Developer's Response:

The Developer attempted to assess the Project based on the effects assessment requirements in the EIRB Terms of Reference. As the EIRB is likely aware, there is very limited qualitative or quantitative information available that links social and cultural effects to the economy. Multiple attempts were made to identify published information and to seek input from government agencies and community organizations.

Information from several Traditional Knowledge (TK) studies (that include Traditional Land Use information) were relied upon during the preparation of the EIS, to the extent possible. Considerable information is available in the 2003 and 2008 versions of the Tuktoyaktuk and Inuvik Inuvialuit Community Conservation Plans (Community of Tuktoyaktuk et al. 2003, 2008; Community of Inuvik et al. 2003, 2008), the Inuvialuit Settlement Region Traditional Knowledge Report (Inuvik Community Corporation et al. 2006), and the various management plans developed by Inuvialuit organizations, particularly relating to harvest and heritage resources. Additional information was also collected during the consultation events. The social and cultural information collected from these documents, consultation records, and published data were used in the baseline and analysis of the EIS.

As discussed previously, the Developer can advise that all attempts were made to use existing data, where available, and to contact service providers to understand the local needs and seek opinion on the potential effects of the Highway on their agency or organization. The Developer kept a detailed log of all communication attempts and conversation records.

In particular, the Developer asked questions that would identify effects from the existing annual winter ice road, to understand social and cultural effects that occur annually when Tuktoyaktuk is linked to Inuvik by road. As well, the Developer asked specific questions of government agencies and community organizations to collect the requested data.

The Developer is undertaking an additional Traditional Knowledge and Traditional Land Use study as described in the response to Category 3 Conformity Request #5.

Shortly after the final Terms of Reference were provided, the Developer clarified expectations regarding socio-economic information. The EIRB indicated that, in cases where information was lacking, that the Developer should attempt to contact service providers and community organizations to collect information. During the discussion, the Developer indicated that due to the sensitive nature of the information requested for collection, that it may not be possible to collect such information.

Although much assistance was provided by GNWT agencies and other service providers, in many cases the information requested in the Terms of Reference were unavailable (i.e., not collected or not analyzed). In these cases, the Developer was unable to create or collect the volume of data requested by the EIRB, but all attempts were undertaken to provide as much relevant information as possible.

Section 4.3 (Human Environment Components) of the EIS discusses the VSCs and other socio-economic components as per the Terms of Reference, and identifies potential issues and project design and mitigation measures. For many of the predicted effects, the mitigation measures identified are within the mandate of other government agencies and service providers to manage, rather than GNWT DOT. The Developer has met with, and continues to meet with, relevant agencies to discuss potential Project effects and mitigation measures. It is anticipated these agencies and departments will provide additional information to the EIRB in the Technical Phase.

References:

Community of Inuvik, Wildlife Management Advisory Council and Joint Secretariat. 2008, November. Inuvik Inuvialuit Community Conservation Plan: A Plan for the Conservation and Management of Renewable Resources and Lands within the Inuvialuit Settlement Region in the Vicinity of Inuvik, Northwest Territories. Retrieved January 8, 2011 from http://www.screeningcommittee.ca/pdf/ccp/Inuvik_CCP.pdf

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Community of Tuktoyaktuk, Wildlife Management Advisory Council and Joint Secretariat. 2008, April. Tuktoyaktuk Community Conservation Plan: A Plan for the Conservation and Management of Natural Resources and Lands within the Inuvialuit Settlement Region in the Vicinity of Tuktoyaktuk, Northwest Territories.

Inuuvik Community Corporation, Tuktuuyaqtuuq Community Corporation and Aklarvik Community Corporation (ICC et al.) 2006, August. Inuvialuit Settlement Region Traditional Knowledge Report. Submitted to Mackenzie Project Environmental Group, Calgary, Alberta. Retrieved November 14, 2010 from http://www.ngps.nt.ca/Upload/Letters%20of%20Comment/Inuvik%20Community%20Corporation/ICC-ISR_TK_Study/ICC_TK_Study.html

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
13	13.1	Environmental and socio-economic effects monitoring	A table with effects monitoring requirements is not provided. No monitoring programs are provided that would test the effectiveness of mitigation measures which are listed in other parts of the EIS. A commitment is made to report on employment, income, and training (upon request). However, there are no plans to monitor socio-economic and cultural effects of the project. Agencies and organizations responsible for ongoing socio-economic monitoring are identified only. There is no information to suggest that discussions to monitor effects of the project have been initiated.

Developer's Response:

As stated in Section 7.0 (Follow-up and Monitoring) of the EIS, the Developer committed to the development of an effects monitoring table prior to commencement of construction. However, as requested, the Developer is pleased to provide the following draft Table 4, which outlines the proposed environmental and socio-economic effects monitoring programs as currently envisaged. The majority of regional and socio-economic effects monitoring efforts will be conducted by other government agencies and organizations, according to their mandate.

Regarding socio-economic parameters, as stated in the EIS, the Developer is committed to requiring its Highway construction contractors to report on employment, income, and training parameters and to provide this information to the appropriate social development agencies. The Developer has no plans to monitor the possible socio-economic and cultural effects of the project, as these are within the mandate of territorial, Inuvialuit and federal responsibilities and programs.

The objectives of the effects monitoring programs include:

- Confirming the effectiveness of approved mitigation measures;
- Verifying the accuracy of predicted effects; and
- Identifying any effects not predicted in the EIS.

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.

Table 4 provides a list of the VCs selected for this Project. As discussed in Section 6.0 (Mitigation and Remediation Summary) of the EIS, VCs were selected based on a combination of the directions provided in the EIRB Terms of Reference (2010), the Developer's understanding of the biophysical and socio-economic components, traditional knowledge as specified in the CCPs, the Inuvialuit Final Agreement and information gathered through consultation. Table 6-1 in the EIS summarizes the mitigation measures and proposed monitoring programs. Upon approval of the Project, a detailed effects monitoring program will be developed in consultation with regulators and interested parties.

The target and management goals described in Table 4 are derived from Table 4-1 in the EIS, which were extracted from the EIRB (2010) Terms of Reference for this Project. The Developer is working towards these goal statements in the design and implementation of this Project. Table 4 is a 'living document' and will be refined during the course of the Technical Review and in further discussions with regulatory agencies.

Reference:

Environmental Impact Review Board (EIRB). 2010, November 3. Environmental Impact Statement Terms of Reference for the Environmental Impact Review of the Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories Development Proposal.

TABLE 4: PROPOSED BIOPHYSICAL AND SOCIO-ECONOMIC EFFECTS MONITORING PROGRAMS

Valued Component	Effects of Concern	Monitoring Program	Indicators	Measurement Parameters	Target or Management Goal	Responsible Party
Noise	• Sensory disturbance • Behaviour alteration / avoidance	• Noise monitoring, if required	• Population exposed to noise from construction activities • Wildlife disturbance	• Population exposed to noise >65 dB • Liaise with local co-management agencies and identify complaints	• Minimize anthropogenic noises throughout the duration of the proposed development. • Avoid the loss, damage or destruction of species at risk and their critical habitat throughout all phases of the proposed development. • Protect all wildlife and wildlife habitat and minimize habitat losses throughout all phases of the proposed development. • Protect all fish and fish habitat and establish a "no-net-loss" of fish habitat throughout all phases of the proposed development. • Avoid negative impacts to human health and safety throughout all phases of development • Minimize or avoid negative impacts to local communities throughout all phases of the proposed development	• Developer / Contractor(s)
Terrain, Geology, Soil and Permafrost	• Change in drainage and surface hydrology • Thaw slumps • Melting of ice-rich ground • Slope and soil instability • Erosion • Subsidence in permafrost • Permafrost thaw and differential settlement	• Environmental monitoring	• Soil disturbance • Changes in permafrost • Intensity of use of granular materials	• Evidence of rilling • Ground cover disturbance by construction • Mean annual ground temperature • Mean annual air temperature • Volume of material taken from borrow sources • Permafrost aggradation	• Protect or minimize impacts to all ground and surface water throughout all phases of the proposed development. • Conserve and minimize or avoid negative impacts to all waterbodies and wetlands throughout all phases of the proposed development. • Protect and minimize impacts to permafrost throughout all phases of the proposed development. • Protect and sustain soils and minimize losses through erosion throughout all phases of the proposed development	• Developer / Contractor(s) • ILA Environmental Monitor(s) • DFO • ILA • AANDC
Water Quality and Quantity	• Reduced water quality or quantity • Contamination of surface water due to spills, erosion, sedimentation • Reduced water quantity • Changes to surface water flow regimes • Effects to fish and/or fish habitat • Effects on human health	• Erosion and sediment control monitoring • Environmental monitoring	• Intensity of use of water resources • Changes in surface water quality	• Frequency, duration and extent of water use • Chemical and physical assessment (dissolved oxygen, pH, temperature, conductivity, total suspended solids, turbidity, total dissolved solids, total/ dissolved organic carbon, total/ dissolved metals, polyaromatic hydrocarbons)	• Protect or minimize impacts to all ground and surface water throughout all phases of the proposed development. • Conserve and minimize or avoid negative impacts to all waterbodies and wetlands throughout all phases of the proposed development. • Protect all fish and fish habitat and establish a "no-net-loss" of fish habitat throughout all phases of the proposed development. • Avoid negative impacts to human health and safety throughout all phases of development • Avoid impeding navigation throughout all phases of development.	• Developer / Contractor(s) • ILA Environmental Monitor(s) • DFO
Changes to Hydrological Regime	• Effects on fish and fish habitat • Effects to downstream users • Flooding of habitat • Disrupted, reduced or eliminated flow • Wetland backfilling	• Environmental monitoring • Fish habitat monitoring • Erosion and sediment control monitoring	• Intensity of use of water resources • Infrastructure design and effectiveness	• Frequency, duration and extent of water use • Areas with disrupted, increased, reduced or eliminated flow • Ice plugs/ blocked flow in culverts	• Protect or minimize impacts to all ground and surface water throughout all phases of the proposed development. • Conserve and minimize or avoid negative impacts to all waterbodies and wetlands throughout all phases of the proposed development. • Protect all fish and fish habitat and establish a "no-net-loss" of fish habitat throughout all phases of the proposed development. • Protect all wildlife and wildlife habitat and minimize habitat losses throughout all phases of the proposed development. • Avoid negative impacts to human health and safety throughout all phases of development • Avoid the loss, damage or destruction of species at risk and their critical habitat throughout all phases of the proposed development. • Avoid impeding navigation throughout all phases of development.	• Developer / Contractor(s) • ILA Environmental Monitor(s) • DFO

TABLE 4: PROPOSED BIOPHYSICAL AND SOCIO-ECONOMIC EFFECTS MONITORING PROGRAMS

Valued Component	Effects of Concern	Monitoring Program	Indicators	Measurement Parameters	Target or Management Goal	Responsible Party
Species at Risk and Species of Special Status or Management Concern	• Mortality or injury • Sensory disturbance • Displacement • Habituation and attraction • Interference with migration • Population effects • Increased harvest pressure • Habitat loss or degradation	• Wildlife monitoring • Environmental monitoring	• Effects predictions • Common indicators used by existing fish and wildlife monitoring programs	• Verify effects predictions and confirm the effectiveness of mitigation measures • Number observations of species at risk or species with special status/ management concern • Common parameters used by existing fish and wildlife monitoring programs	• Avoid the loss, damage or destruction of species at risk and their critical habitat throughout all phases of the proposed development. • Protect all wildlife and wildlife habitat and minimize habitat losses throughout all phases of the proposed development. • Protect and avoid disturbance or destruction to migratory birds and their habitat throughout all phases of the proposed development. • Protect all fish and fish habitat and establish a "no-net-loss" of fish habitat throughout all phases of the proposed development.	• Developer/ Contractor(s) • HTC Wildlife Monitor(s) • Government and co-management agencies
Land and Resource Use by Inuvialuit	• Improved access to areas used for hunting and fishing • Potential increased hunting pressure on wildlife • Potential alteration to wildlife distribution patterns	• Wildlife monitoring • Socio-economic monitoring	• Intensity of land and resource use by Inuvialuit • Change in land use by transport infrastructure • Common indicators used by existing fish and wildlife monitoring programs	• Fish, wildlife and berry harvest levels • Frequency, duration and location of fish, wildlife and berry harvest • Highway traffic trends • Number of complaints from local co-management agencies • Common parameters used by existing fish and wildlife monitoring programs	• Protect important land use areas. • Minimize or avoid negative impacts to local communities throughout all phases of the proposed development. • Pursue economic development opportunities that do not adversely impact environmental, social, and cultural conditions/wellness. • Conserve species used for wildlife harvesting throughout all phases of the proposed development. • Preserve culture, heritage and archaeology throughout all phases of development.	• Developer/ Contractor(s) • ILA Environmental Monitor(s) • HTC Wildlife Monitor(s) • Government and co-management agencies
Areas of Special Ecological and Cultural Importance	• Potential construction-related effects • Improved access to or near areas of ecological and cultural importance • Potential effects from Highway users	• Socio-economic monitoring	• Effects predictions • Intensity of use of Husky Lakes area • Change in land use	• Verify effects predictions and confirm the effectiveness of mitigation measures • Frequency and duration of Husky Lake use • Land use patterns and/or conversions • Number of complaints from local co-management agencies	• Protect important land use areas. • Preserve culture, heritage and archaeology throughout all phases of development.	• Developer/ Contractor(s) • ILA • HTCs • Co-management agencies
Land Designation Areas (per *IFA*/ CCPs)	• Potential construction-related effects • Improved access to special management areas • Potential effects from Highway users	• Socio-economic monitoring	• Effects predictions • Intensity of use of special management areas, as identified in the CCPs	• Verify effects predictions and confirm the effectiveness of mitigation measures • Frequency, duration and location of use by residents and non-residents • Land use patterns and conversions in sensitive areas	• Protect important land use areas. • Preserve culture, heritage and archaeology throughout all phases of development.	• ILA • HTCs • Co-management agencies
Tourism, Commercial and Public Recreational Use	• Improved tourism and recreational use • Increased opportunities for commercial ventures • Potential effects to tourist attractions during construction	• Socio-economic monitoring	• Change in tourism, commercial and recreational businesses and revenues	• Number of tourists • Amount spent by tourists • Number and types of businesses operating in Inuvik and Tuktoyaktuk • Household consumption expenditure for commercial and recreational use • Land used for recreation • Highway traffic trends • Number of complaints from local co-management agencies	• Protect important land use areas. • Preserve culture, heritage and archaeology throughout all phases of development. • Pursue economic development opportunities that do not adversely impact environmental, social, and cultural conditions/wellness	• Developer/ Contractor(s) • Government and co-management agencies

TABLE 4: PROPOSED BIOPHYSICAL AND SOCIO-ECONOMIC EFFECTS MONITORING PROGRAMS

Valued Component	Effects of Concern	Monitoring Program	Indicators	Measurement Parameters	Target or Management Goal	Responsible Party
Heritage and Archaeological Sites	• Increased access to heritage sites • Potential effects to archaeological resources and sites	• Environmental monitoring • Socio-economic monitoring	• Heritage and archaeological sites conservation	• Number of heritage and archaeological sites identified, disturbed, and/or relocated.	• Protect important land use areas. • Preserve culture, heritage and archaeology throughout all phases of development. • Pursue economic development opportunities that do not adversely impact environmental, social, and cultural conditions/wellness	• Developer/ Contractor(s) • Qualified archaeologist • Prince of Wales Northern Heritage Centre

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
14	13.2	Compliance monitoring	There is no tangible information on compliance monitoring in the EIS.

Developer's Response:

As stated in Section 7.0 (Follow-up and Monitoring) of the EIS, the Developer committed to the development of a compliance monitoring table prior to commencement of construction. As requested, the Developer is pleased to provide the following draft Table 5, which outlines the proposed compliance monitoring program including the regulatory requirement, applicable terms and conditions, monitoring or inspection requirements and frequency, and the responsible authority. This table should be considered a 'living document' and will need to be modified and updated as appropriate as the future terms and conditions of regulatory approvals, licences and permits become available.

The purpose of the compliance monitoring table is to confirm that the terms and conditions set out in regulatory approvals, licences and permits, and in the commitments submitted by the Developer, will be adhered to and met.

Since the approvals, licences and permits have not been issued yet, the table will need to be updated once the regulatory requirements are known. Compliance monitoring will concentrate primarily on the construction phase of the Project. Operations phase compliance monitoring will focus primarily on traffic control, Highway safety, and potentially fish and wildlife permits.

As part of compliance monitoring, qualified environmental and wildlife monitors, provided by the ILA and HTCs, respectively, will monitor Project activities during construction to ensure work is conducted in accordance with applicable regulations, commitments and mitigation measures. In addition, the monitors will provide advice to the construction contractor(s) and report their observations to the appropriate management agency (i.e., ILA or HTC) and designated Project contact.

It is anticipated that the territorial and federal agencies that are responsible for issuing certain permits and approvals will also send inspectors to the construction site(s) to inspect project activities and provide feedback to the Developer.

TABLE 5: COMPLIANCE MONITORING REQUIREMENTS

Regulatory Requirement	Issuing Authority	Project Phase	Terms and Conditions from Issuing Authority	Compliance Monitoring or Inspection Requirement	Monitoring or Inspection Frequency	Responsible Authority
Environmental Impact Assessment – Decision Document	EIRB AANDC Governor-in-Council	Construction and operation	To be determined	As specified in authorization	As specified in authorization	As specified in authorization
AANDC notification to access Crown lands for reconnaissance purposes to potential borrow sources	AANDC	Construction	No requirement to permit this activity.	None	NA	NA
ILA notification to access private lands for reconnaissance purposes to potential borrow sources	ILA	Construction	a) The Government of the Northwest Territories, Department of Transportation shall be the Proponent for this Project. b) The Project consists of accessing borrow sources 173/305, 174/306, 172, 170, 27B and 177 by helicopter, and taking GPS readings, survey data and shallow samples by hand shoveling. c) The Proponent shall carry out the Project solely at his own risk and shall have no right of action against the Inuvialuit for alleged loss or damage there from. d) The Proponent shall comply with the provisions of the Inuvialuit Land Administration Rules and Procedures (ILA Rules), as the same may be amended from time to time, and with the *Western Arctic (Inuvialuit) Claims Settlement Act*, the *Inuvialuit Final Agreement* (*IFA*), the *GNWT Access and Use of Inuvialuit Private Lands* agreement, and the laws of general application. e) The Proponent shall obtain all necessary permits and permissions prior to conducting the Project. f) The Proponent shall provide the Administrator with all reports generated by the Project and any other information that may be required in accordance with the ILA Rules. g) The Proponent shall compensate the Inuvialuit for any damage to Inuvialuit Lands or for any diminution of the value of the Inuvialuit interest in such lands in accordance with the ILA Rules. h) The Proponent shall compensate Inuvialuit or any affected third persons for any damage or accidents as a result of the Project. i) When the Proponent intends to procure goods or services to carry out the operations described in the application, the Licensee shall first provide opportunity for Inuvialuit businesses to supply the required goods or services. Provided that the goods and services required can be supplied on a competitive and timely basis and can meet or exceed the Proponent's safety, environmental, technical and quality standards, as determined by the Licensee, the contract will be awarded to the Inuvialuit business. j) The Proponent shall use drip pans, or other similar preventative measures, when refueling equipment on site. k) The Proponent shall backhaul and remove all equipment, garbage, refuse and materials brought to site for this Project upon Project completion. l) The Proponent shall consult with the relevant Hunters and Trappers Committee to ascertain whether a wildlife monitor is required for the Project. m) The Proponent shall report all spills to the ILA and the 24 Hour Spill Report Line (867) 920-8130 immediately upon discovery. n) The Proponent shall not disturb any archaeological sites. If, during the course of the Project, an archaeology site is encountered, the Proponent shall immediately vacate the site and report the incident to the ILA.	The Developer shall provide the ILA with all reports generated by the Project and any other information that may be required in accordance with the ILA Rules.	Not specified	GNWT DOT

TABLE 5: COMPLIANCE MONITORING REQUIREMENTS

Regulatory Requirement	Issuing Authority	Project Phase	Terms and Conditions from Issuing Authority	Compliance Monitoring or Inspection Requirement	Monitoring or Inspection Frequency	Responsible Authority
Temporary Right-of-Way	ILA	Construction	To be determined	As specified in authorization	As specified in authorization	As specified in authorization
Land Use Permit	ILA	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Quarry Permit	ILA	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Access Agreement	ILA	Construction	To be determined	As specified in agreement	As specified in agreement	As specified in agreement
Class A Land Use Permit	AANDC	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Quarrying Permits	AANDC	Construction	To be determined	As specified in permits	As specified in permits	As specified in permits
Type A Water Licence	NWTWB	Construction	To be determined	As specified in license	As specified in license	As specified in license
Letter of Advice	DFO	Construction	To be determined	As specified in letter of advice	As specified in letter of advice	As specified in letter of advice
Authorization for HADD	DFO	Construction	To be determined	As specified in authorization	As specified in authorization	As specified in authorization
Licence to Fish for Scientific Purposes	DFO	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Permit for construction of bridges across navigable waterbodies	Transport Canada	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Scientific Research License	Aurora Research Institute	Construction	To be determined	As specified in license	As specified in license	As specified in license
Wildlife Research Permits	GNWT ENR	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Archaeological Permit	PWNHC	Construction	To be determined	As specified in permit	As specified in permit	As specified in permit
Type B Water Licence	NWTWB	Operations	To be determined	As specified in license	As specified in license	As specified in license
Public Highways Regulation	GNWT DOJ	Operations	To be determined	As specified in regulation	As specified in regulation	RCMP
Wildlife Licenses, Permits, and Management	GNWT ENR, ILA, HTC, FJMC, WMAC, IGC	Operations	To be determined	As specified licenses, permits, and management	As specified in licenses, permits, and management	GNWT ENR and DOT, ILA, HTC, FJMC, WMAC, IGC

3.0 CATEGORY 2: SPECIFIC NON-CRITICAL INFORMATION DEFICIENCIES

According to the EIRB, a non-critical information deficiency was identified when information the EIRB considers to be required to inform the technical review phase has not been provided in the EIS. The nature of a non-critical deficiency may be either that information is lacking altogether, or has not been provided in sufficient detail for some or all of the identified biophysical and/or human environment components listed in the EIS Terms of Reference. The deficiency is considered non-critical because the EIRB considers that the deficiency can be adequately addressed during the technical review phase.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
1	4	The Executive Summary shall be submitted in English, and in the following Inuvialuktun dialects: • Siglitun • Uummarmiutun	Executive Summary to be provided in the indicated languages/dialects upon submission of the final EIS

Developer's Response:

Translation of the Executive Summary into the two Inuvialuktun dialects (Siglitun and Uummarmiutun) is underway and will be provided to the EIRB as soon as they are completed.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
2	5.4	Overview of biophysical and human environment settings for preferred and alternate options.	The general overview of the ecological setting is missing.

Developer's Response:

The Developer acknowledges that a general overview of the ecological setting is not included in the introductory Section 1.4 (The Development Setting) of the EIS. This is because an overview of the ecological setting is provided in the Executive Summary, which immediately precedes the introductory section (Section 1.0 Introduction) and it was judged to be redundant and unnecessary to repeat in Section 1.4. Regarding the environmental conditions of the alternate alignments considered, to the extent of available information, this information is presented and discussed for all VCs in Section 3.1 (Biophysical Environment).

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
3	6.2	Scope of project components and activities • Detailed description of all proposed development components and associated activities for all phases of the development	Information is missing for: other drainage and thermal erosion control structures; management of excavation material including stockpiles; and, the handling, storage and use of explosives.

Developer's Response:

Drainage and Thermal Erosion Control Structures

Drainage and thermal erosion considerations are discussed in Section 2.6.7 (Drainage and Thermal Erosion Considerations) of the EIS. Further information on drainage control is provided in Section 2.6.6 (Stream Crossing Design Considerations), and Section 2.6.4 (Design Embankment) discusses the importance of embankment thicknesses to protect the underlying thermal regime.

Management of Excavation Material

The management of excavation material, including stockpiles, is discussed in Section 2.6.8 (Borrow Sources) of the EIS. Section 2.6.8.6 (Pit Development Plans) provides further detail on how a typical borrow source will be developed and the information required for the preparation of the source-specific Pit Development Plan.

Handling, Storage, and Use of Explosives

The handling, storage, and use of explosives (if required) are not explicitly discussed in the Project Description section of the EIS (Section 2.0 Project Description). However, acknowledgement that the Developer is committed to conformance with the requirements of the *Explosives Use Act* is identified in Section 4.0 (Impact Assessment). Furthermore, in Section 1.5.1.4 (Fisheries and Oceans Canada Authorizations), the Developer notes that "borrow sources will not be developed within 50 m of any watercourse and 1 km of the Husky Lakes. Where blasting is required, DFO guidelines for the use of explosives will be followed."

During the development of the Source 177 deposit for construction of the all-weather access road to Tuktoyaktuk, an explosive agent (Amex - a packaged blend of ammonium nitrate and fuel oil) was used as necessary to help break up and loosen the frozen borrow material prior to excavation and use for construction of the road embankment.

To ensure the safety of the operation, the explosive agents (Amex and boosters) and blasting caps (detonators) were transported to site by approved and licensed carriers. The detonators were stored in a separate locked compartment from the Amex and boosters. Once on-site the Amex, boosters and detonators were stored in separately locked and certified magazines. At the storage site the blaster assumed control of the products and held

the key(s) to the magazines, all products were logged and any time product was added or removed it is recorded in the magazine logs. Prior to conducting blasting operations, the contractor conducted pre-construction safety and orientation meetings. The following procedures, extracted from the safety presentation, were presented to all personnel involved with the blasting operations:

- The worksite where explosives are being used will be under the control of the certified blasting supervisor, who has been deemed competent.
- The contractor will adhere to the *Mine Health and Safety Act* and the *Explosives Regulations*.
- The blasting contractor will take every reasonable measure and precaution to protect the health and safety of employees and other persons at the worksite.
- All personnel working with or near explosives will be familiar with the applicable safe work practices being utilized at the worksite.
- Before the detonation of an explosive, the certified blaster will ensure that all safety precautions set out in the permit are in place.
- Prior to the detonation of an explosive the certified blaster will sound an audible warning at a reasonable time before the detonation.
- The certified blaster will ensure that all avenues of approach to the site have been guarded.
- They will ensure that all workers and other persons near the site of the blast site have reached a place of safety. At the Source 177 site the ILA Monitors will check the area for both human and animal presence prior to any detonation to ensure the area is clear.
- After any detonation of explosives the certified blaster will make an immediate inspection of the worksite.
- They will not permit any person to return to the site until the inspection has been completed and they have given the "All Clear" signal.
- The ILA Monitors will recheck the surrounding area to ensure no wildlife, such as bears have been disturbed.
- The certified blaster will shout "Fire" immediately before detonating the explosive.
- There is absolutely no smoking or open flames allowed within 20 m of any blast pattern or explosive material.
- All explosive material must be handled with care.

Similar procedures will be employed for future explosives operations associated with the development and extraction of aggregate material for construction of the Highway.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
4	8.1	Key issues identification	Would like to see inclusion of Polar Bears as a VEC.

Developer's Response:

Table 3.1.9-1 of the EIS reflects species that might occur within the Regional Study Area based on the NWT Species Monitoring Infobase maintained by the GNWT Department of Environment and Natural Resources. Given the distribution of polar bears and its habitat, the Project was recognized as having no effect on this species. Category 3 Conformity Response #11 provides supplemental information and an assessment.

In the context of the proposed Inuvik to Tuktoyaktuk Highway, polar bears might be expected to occur on the land in the vicinity of the proposed Highway on very rare occasions during the construction program or long-term operation of the Highway. The term "Valued Component" has been reserved for key species of importance that are likely affected by the Project. This assessment confirms that polar bears will not be directly or indirectly affected by the Project and therefore should not be a Valued Component. However, an assessment has been done which meets the requirements of *SARA*.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
5	8.2.1	Spatial boundaries identified	Does not include a discussion of the rationales for choosing the VECs used.

Developer's Response:

Information on the rationale for selection of the VECs is provided in Section 4.1.2 (Valued Components) of the EIS. The selection of VCs for this EIS is based on a combination of the directions provided in the EIRB Terms of Reference (2010), the Developer's understanding of the biophysical or socio-economic components, traditional knowledge as specified in the CCPs, the *Inuvialuit Final Agreement*, and the consultation results.

A discussion regarding spatial boundaries is identified in Section 4.1.3.1 (Spatial Boundaries) of the EIS.

Reference:

Environmental Impact Review Board (EIRB). 2010, November 3. Environmental Impact Statement Terms of Reference for the Environmental Impact Review of the Hamlet of Tuktoyaktuk, Town of Inuvik and GNWT – Construction of the Inuvik to Tuktoyaktuk Highway, Northwest Territories Development Proposal.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
6	9.2	Human environment • Demographics • Regional and local economies • Education, training and skills • Infrastructure and institutional capacity • Human health and community wellness • Socio-cultural patterns • Harvesting • Land use • Heritage resources	Some of the data presented requires further explanation, and additional data from other (identified) sources needs to be provided. There are also gaps in the presentation and discussion of baseline data for some of the Terms of Reference requirements. Presentation of the baseline data shows a lack of understanding as to how the data should inform the assessment. Only in some cases has data been confirmed through discussion with local community organization representatives.

Developer's Response:

The Developer can advise that all attempts were made to use existing data, where available, and to contact service providers to understand the local needs and seek opinion on the potential effects of the Highway on their agency or organization. The Developer kept a detailed log of all communication attempts and conversation records. In particular, the Developer asked questions that would identify effects from the existing annual winter ice road, to understand social and cultural effects that occur annually when Tuktoyaktuk is linked to Inuvik by road. As well, the Developer asked specific questions of government agencies and community organizations to collect the requested data.

The Developer found that several people:

- did not wish to be identified;
- did not want to respond to the questions;
- felt that their opinion would be biased; and/or
- were in some way linked to this process, and therefore could not comment due to a potential conflict of interest.

The Developer had advised the EIRB shortly after the final Terms of Reference were provided that, due to the sensitive nature of the information requested for collection, that it may not be possible to collect such information.

Although much assistance was provided by GNWT agencies and other service providers, in many cases the information requested in the Terms of Reference were unavailable (i.e., not collected or not analyzed). In these cases, the Developer was unable to create or collect the volume of data requested by the EIRB, but all attempts were undertaken to provide as much relevant information as possible.

The Developer did not attempt to confirm the data in the community in situations where data were previously published.

The information in the baseline section is presented according to the Terms of Reference. The Developer agrees that the baseline could have been presented in an alternate format, but wanted to try to conform to the EIRB's expectations for information, based on the Terms of Reference.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
7	10.3	Potential accidents and malfunctions description and analysis	Potential accidents and malfunctions description and analysis is inadequate for social, cultural and economic components.

Developer's Response:

The Developer acknowledges that the Accidents and Malfunctions section of the EIS concentrated primarily on potential environmental effects associated with the range of possible accidents and malfunctions that could occur in relation to the construction and operation of the Highway.

However, Section 4.4.4 (Vehicle Crashes) of the EIS provides a discussion on vehicle accidents. The Developer believes that traffic accidents related to the road represent the most likely type of incident that would involve the general public and which could have social implications.

As indicated in Section 4.4.4, safety measures to prevent vehicle accidents on the proposed Highway have been and will continue to be incorporated into the Highway design. According to the GNWT DOT, there were 861 vehicle collisions in 2008, 179 or 21% of which occurred on highways in the NWT; the remaining accidents were in urban centres or involved all-terrain vehicles (GNWT DOT 2009a, 2009b).

Measures to avoid or minimize accidents will include posted speed limits, adequate signage alerting drivers to Highway curves and upcoming bridges. Bridge design will incorporate guardrails to prevent a vehicle from going off the Highway and into a watercourse in the event of an accident.

While it is recognized that a year-round Highway will increase overall traffic volume, which correspondingly may increase the number of emergency incidents, Corporal Doorinbos did not anticipate many fatal collisions on the Highway as there have been very few on the winter road (S. Doorinbos, Corporal, Inuvik RCMP, pers. comm., January 26, 2011).

As indicated in Section 2.8 (Life of the Project) of the EIS, the Highway users are anticipated to fall into one of the following categories: residents of Inuvik and Tuktoyaktuk; regional residents; tourists; and hauling companies.

The winter road currently experiences annual daily traffic of 139 vehicles (GNWT DOT 2009b). It is anticipated that with increased shipping of goods and increased tourism, that

short-term use of the Highway will range between 150 to 200 vehicles per day. This is considered to be a low traffic Highway. It is projected that without major development in the region, that this may increase slightly over time. However, if major development occurs in the region, such as the Mackenzie Gas Project, the amount of traffic may increase.

Assuming that the Mackenzie Gas Project proceeds, GNWT DOT, the Inuvialuit Regional Corporation, and other interested parties will need to work with the Mackenzie Gas proponents to ensure that increasing traffic usage of the Highway is effectively managed.

Economic and cultural impacts are also considered in the Worst Case Scenario presented in Section 4.4.5 of the EIS. Consistent with Section 13(1)(a) of the *Inuvialuit Final Agreement* (*IFA*) the Developer is required to evaluate a worst case scenario to provide an "estimate of the potential liability of the developer, determined on a worst case scenario, taking into consideration the balance between economic factors, including the ability of the developer to pay, and environmental factors."

One of the objectives of the *Inuvialuit Final Agreement* (*IFA*) is to prevent damage to wildlife and its habitat and to avoid disruption of Inuvialuit harvesting activities by reason of development (*IFA* Section 13(1)(a)). As such, when a development is proposed, the EIRB must establish limits of liability for a project proponent or developer. The proposed Highway from Inuvik to Tuktoyaktuk is subject to these terms.

References:

Government of the Northwest Territories, Department of Transportation (GNWT DOT). 2009a. 2009 NWT Traffic Collision Facts – Department of Transportation Road Licensing and Safety Division. Retrieved from http://vancouver.projects.eba.ca/sites/projects/V23201322/004/Traffic%20Info/2008%20NWT%20Traffic%20Collision%20Facts%20Report.pdf

Government of the Northwest Territories, Department of Transportation (GNWT DOT). 2009b. Traffic Counts from NWT Highway Traffic 2008. Retrieved from http://www.dot.gov.nt.ca/_live/documents/content/HighwayTrafficStats_2008.pdf

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
8	10.5	Determination of significance • description and threshold justification	The discussion of the level of consequence and magnitude should include an explicit discussion of significance.

Developer's Response:

The significance determination of residual effects generated from the effects assessment has relied, in part, on identified biophysical and human environmental consequences, ecological or socio-economic context, likelihood of the residual effect occurring, and best professional judgement.

For each residual effect, the level of significance was evaluated according to the expected change in overall condition of the VC being assessed. When evaluating significance the precautionary principle was adhered to, such that where there was uncertainty about how a VC would be affected, the final evaluation was based on the greater of the possible effects.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
9	11	Cumulative Effects Assessment • VEC and VSC selection • Potential cumulative effects identified • Evaluation • Discussion of potential induced effects	The timeframe used for the cumulative effects assessment is inadequate for the life of the project. There is also a lack of any robust consideration of potential induced effects.

Developer's Response:

Section 2.8 (Life of the Project) of the EIS states that "the Highway is intended for permanent, long-term use." The Developer decided not to attempt to define what is meant by the terms "permanent, long-term use", but it is reasonable to assume that the Highway, once constructed, would continue to exist and operate for the foreseeable future – at least the next 100 years.

The rationale for selecting the 10 year temporal timeframe for the cumulative effects assessment portion of the EIS is that it includes a reasonable number of years that spans both the construction (four years) and initial operation (six years) of the Highway. This timeframe also recognized a basic assumption of cumulative effects assessment that the other projects or activities to be considered should include those projects or activities that are currently under regulatory review, or are reasonably likely to occur and are not hypothetical.

The outer limit of the temporal timeframe selected could conceivably have been extended to 20 years or more, but this is not considered to be necessary or appropriate as the assessment would need to have extended into the realm of hypothetical projects, and baseline environmental parameters (such as future fish and wildlife population cycles) will likely have changed in a currently unpredictable manner.

It is the view of the Developer that the various timeframes stated in the current EIS are all appropriate in the context used and do not affect the adequacy of the information provided in the EIS or the assessment thereof.

The information provided in Section 5.3 (Other Past, Present and future Projects/ Activities Considered) of the EIS indicated that for each of the projects / activities considered, there is generally no or little opportunity for potentially cumulative environmental effects to occur between or among the projects assessed. This general

conclusion is consistent with the key conclusions of the considerably more comprehensive cumulative effects assessment previously completed for the Mackenzie Gas Project.

#	TOR Section	TOR Requirement	Identified Critical Information Deficiencies
10	13.4	Socio-economic and cultural effects management, policies and commitments	Some commitments have been made to manage some economic effects (i.e. local procurement and employment). Agencies and organizations responsible for effects management are identified, but most often, no mitigation measures are suggested. In some cases, social, cultural and some economic effects are superficially identified, and will be difficult to manage and monitor with this superficial treatment.

Developer's Response:

Throughout the EIS, the Developer has made several commitments and identified management policies related to the construction and operation of the Highway. In response to Section 13.4 of the Terms of Reference, the Developer has summarized, and/or provided additional information as follows. Additional information regarding the monitoring programs is provided in the response to Category 3 Conformity Request #13.

The Developer is committed to preferential employment opportunities for qualified local residents and contractors. It is understood by the Developer that several government agencies are mandated to monitor socio-economic and cultural effects in the NWT and to implement mitigation measures as necessary. The implementation of focused socio-economic measures will be the responsibility of the Developer and on-site contractors, as described in the following section.

Requirements by contractor(s) to comply with the mitigation measures include:

- The contractor(s) will be required to comply with the mitigation measures and applicable commitments, as identified in the EIS.
- In addition, the contractor(s) selected to construct the Highway will be required to have the following management plans:
  - Contractor health, safety and environment (HSE) manuals including general spill contingency and emergency response plans;
  - Contractor work procedures documents;
  - Site-specific health and safety plans; and
  - Site-specific spill contingency plans.

Policies related to recruitment, training, hiring, pay equity and employment, including those policies specifically for Aboriginal and local candidates, and those promoting participation include:

- The *IFA* guidelines for business operation will apply to this Project, giving priority hiring to companies included on the Inuvialuit Business List. This will help to provide economic stimulus to the Inuvialuit community.
- The Developer is committed to preferential employment opportunities for qualified local residents and contractors. The implementation of focused socioeconomic measures will be the responsibility of the Developer and on-site contractors.
- The Developer is committed to ensuring that the people of Tuktoyaktuk and Inuvik have preferential employment opportunities to provide employment benefits to the region.
- Employment opportunities will be available to all residents, male or female, and will likely result in increased seasonal employment during construction.

Policies related to contracting and procurement policies, including those which promote local sourcing, and participation of local businesses include:

- Although it is anticipated that local and regional suppliers, contractors and residents will be able to provide the majority of construction related services, some may be sourced from outside the region.
- The Developer is committed to preferential employment opportunities for qualified local residents and contractors.
- The *IFA* guidelines for business operation will apply to this Project, giving priority hiring to companies included on the Inuvialuit Business List. This will help to provide economic stimulus to the Inuvialuit community.

Policies related to employment, including policies on alcohol and drugs on the job site, harassment policies, firearms policies, work and pay schedules, and any policies related to worker access to harvesting areas:

- The contractor(s) hired to construct the Highway will be required to have employment policies in place related to alcohol and drugs on the job site, harassment, firearms, and work and pay schedules.
- The contractor(s) will be required to comply with all applicable legislation related to employment, including the *Employment Standards Act* and *Occupational Health and Safety Act*.

Policies in the EIS related to the commuting and rotation of workers and contractors include:

- Resupply of personnel, material, food and equipment is possible throughout the construction season by way of the parallel winter road and on completed portions of the Highway.
- Effective logistics planning will be used to minimize vehicle movements, such as the use of vans or extended cab pick-up trucks to transport workers.

- For the more limited construction activities taking place in the snow-free seasons, it is anticipated that workers will be transported to/from the work site daily, along the constructed Highway embankment.
- No policy has been established for worker rotation; this will be based on the negotiated agreement with the Developer and the selected contractor(s).

Policies related to managing hunting, fishing and gathering on, or from, the work site by non-Inuvialuit employees and contractors, while respecting the harvest rights of Aboriginal employees and contractors include:

- During the construction phase, employees will be restricted from hunting while working on the Highway.
- Implementing a "no hunting" policy for Highway construction and maintenance workers.
- A public education program and signage related to harvesting, fishing, hunting, and responsible use of the Highway will be installed at appropriate and highly visible locations.
- Management of wildlife and fish populations will continue to be managed by GNWT ENR, DFO the Wildlife Management Advisory Council, the Fisheries Joint Management Committee, and the HTCs.
- Workers will not walk off-site onto land at any time of year, unless there is a specific requirement (i.e., waste recovery), and these activities will be scheduled to avoid sensitive wildlife periods.

Policies related to occupational health and safety and related training, and emergency response plans for workplace accidents include:

- Safety is the utmost importance to the Government of the Northwest Territories. The contractor will be responsible for providing a detailed Safety Plan and will be required to conform with health and safety legislation and regulations including *Occupational Health and Safety Act, Public Health Act, Workers Compensation Act,* and *Explosives Use Act*;
- The contractor shall identify worksite hazards and shall develop operational occupational safety policies, procedures and plans that are specific to those hazardous aspects of the Project to ensure the safety of every person at a construction or maintenance site. The GNWT may order the suspension of work in cases of imminent danger or when the contractor fails to comply with *Occupational Health and Safety Act* or fails to rectify previously identified worksite hazards;

- In addition, the contractor(s) selected to construct the Highway will be required to have the following management plans:
  - Contractor health, safety and environment (HSE) manuals including general spill contingency and emergency response plans;
  - Contractor work procedures documents;
  - Site-specific health and safety plans; and
  - Site-specific spill contingency plans.
- The Field Supervisor and Safety Advisor will educate all field workers on the applicable practices contained within the wildlife protection plan;
- As a safety measure, all workers will receive, at minimum, a basic wildlife orientation and GNWT Bear Safety Guidelines training, and will be instructed not to disturb any wildlife;
- Conformance with existing applicable GNWT and Workers Compensation Board standards; and
- Workers will not walk off-site onto land at any time of year, unless there is a specific requirement (i.e., waste recovery), and these activities will be scheduled to avoid sensitive wildlife periods.

Policies related to scheduling of construction activities to accommodate needs of Aboriginal harvesters (employees, contractors, and non-employees) include:

- The primary construction season is during winter and early spring months, when the ground is still frozen. This allows employees, contractors and non-employees to conduct spring, summer and fall harvesting. Winter harvesting activities by employees and contractors may continue during scheduled days off.
- Non-employees may continue to harvest during the winter months, but at a safe distance from the construction activities that may be occurring.

Policies related to scheduling of work activities to accommodate needs of Aboriginal employees and contractors to pursue other traditional activities include:

- The primary construction season is during winter and early spring months, when the ground is still frozen. This allows workers to conduct spring, summer and fall harvesting. Winter harvesting activities may continue during scheduled days off.

The Inuvik to Tuktoyaktuk Highway will promote activities and programs that increase community stability and wellness by:

- providing year-round access between Inuvik and Tuktoyaktuk;
- providing Tuktoyaktuk residents with access to increased services in Inuvik, including medical, social, recreational and educational services;

- providing Tuktoyaktuk residents with access to increased employment opportunities in Inuvik;
- increasing opportunities for industrial and commercial development, which will create employment opportunities in the region; this ultimately improves community stability and family wellness by allowing residents to live and work in the region instead of moving to other communities;
- creating increased access to harvesting areas, which may create improved food security; although it is recognized that increased access to harvest areas may also create adverse effects unless managed by responsible agencies;
- reducing the cost of living for Tuktoyaktuk residents;
- promoting family, community, and sporting interactions by providing year- round access between communities;
- increasing opportunities to promote the communities, culture and arts and crafts to tourists; and
- providing the opportunity for government agencies to provide services in Tuktoyaktuk at a cheaper cost.

4.0 CLOSURE

We trust these responses meet your present requirements. Should you have any questions or comments, please contact Mr. Jim Stevens of GNWT Department of Transportation at your convenience.