ENVIRONMENTAL IMPACT REVIEW BOARD

INFORMATION REQUESTS

(Round 1)

DATE OF RELEASE: **January 16, 2012**

DISTRIBUTION: **Developer and the EIRB Electronic On-line Registry (EOR).**

PURPOSE: **Information Requests (IRs) issued by the EIRB to the Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik) of the proposed Inuvik to Tuktoyaktuk Highway Project.**

DEADLINE FOR SUBMISSION OF RESPONSES: **February 6, 2012**

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ACRONYMS

CCP	Community Conservation Plan
CEAA	Canadian Environmental Assessment Act
DFO	Department of Fisheries and Oceans
DOT	Department of Transportation
EIA	Environmental Impact Assessment
EIRB	Environmental Impact Review Board
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
ENR	Environment and Natural Resources
GDP	Gross Domestic Product
GNWT	Government of the Northwest Territories
HSE	Health, Safety and Environmental Policies
HTC	Hunters and Trappers Committee
IFA	Inuvialuit Final Agreement, as Amended April 2005
IR	Information Request
ILA	Inuvialuit Land Administration
ISR	Inuvialuit Settlement Region
LSA	Local Study Area
MSES	Management Solutions in Environmental Science
NWT	Northwest Territories
RSA	Regional Study Area
VC	Valued Components
VEC	Valued Ecological Component
VSC	Value Socio-economic Component
ZOI	Zone of Influence

1.0 Instructions to the Developer

The Developer is required to follow the instructions provided below in responding to the attached Information Requests (IRs) from the EIRB.

1. **Explain and justify** – many of the IRs are qualified in the request statement(s) with the words "explain and justify". These words have the following meanings:

    a. **Explain –** provide a clear, complete, and as much as possible, plain language explanation of what the request is asking for.

    b. **Justify –** use scientifically or technically defensible rationale and literature sources to support the statements being made, analytical approach, and conclusions reached in the IR responses.

2. **Developer response to IRs –** please respond to each IR and each question separately, and in as much detail as required to assist the Board.

3. **Developer questions about the IRs –** if the representatives of the Developer have any questions about any of the IRs, or require clarification of what is being requested, they should contact the EIRB through the contact listed below:

Eli Nasogaluak
EIR Coordinator
107 Mackenzie Road, Suite 204
P.O. Box 2120
Inuvik, NT X0E 0T0
867-777-2828 (phone)
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eirb@jointsec.nt.ca (email)

2.0 Information Requests

2.1 Assessment Approach

IR Number: 1

To: Department of Transportation (DOT) and the Hamlet of Tuktoyaktuk

Subject: Project partnership and past performance by the Developer (Executive Summary, p. i; EIS Section 1.1.2, p. 1-4; EIS Section 1.5.1, p. 15)

Preamble
The DOT and the Hamlet of Tuktoyaktuk (two of the Developer partners) have previously collaborated to facilitate the successful development and completion in 2010 of the all-weather access road from Tuktoyaktuk to Granular Source 177. As the Developer has indicated, this access road can be considered a 'pilot project' for the currently proposed Project in terms of environmental review and permitting, cost, schedule, logistics, construction methods, environmental protection, and effects mitigation. From this recent experience there should be first-hand information available with respect to the ability to successfully minimize or eliminate environmental impacts. This information will assist in detailing the past environmental performance of the Developer.

Request

1. In the context of the all-weather access road from Tuktoyaktuk to Granular Source 177, please identify and discuss specific environmental mitigation strategies that were identified as being successful and explain how the relative effectiveness of the mitigation was measured.
2. Please identify and discuss the specific 'lessons learned' with respect to the development of the all-weather access road from Tuktoyaktuk to Granular Source 177 and how this information will assist with, and can be applied to the proposed Development.

IR Number: 2

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Route alignment alternatives (Executive Summary, Table 1, p. vi; EIS Section 1.2, p. 5; November 2011 Correspondence: Letter to EIRB re Upland Route November 2011)

Preamble

Based on the multiple-accounts analysis that was undertaken and presented in the EIS and the Addendum to the EIS, the Developer's position is that the Primary 2009 Route with the possible incorporation of Alternative 3 (2010 Minor Realignment) should remain in consideration for the future design of the Project and may even be considered the preferred final alignment.

The Developer's position is that the adoption of this alternate alignment as part of the total Primary 2009 Route will capitalize on several important technical and economic advantages, as outlined in the November 9, 2011 letter to the EIRB.

The Developer has also explained why Alternative 2 (Upland Route) was eliminated from Consideration in the EIRB Review. However, there is no indication of the basis for this decision beyond professional judgement.

In addition, it appears that no engineering or environmental assessment work has been completed to support any decision-making surrounding Alternative 3. The Developer states that if the project is approved, Alternative 3 would be further considered and likely adopted in the detailed design stage based on additional information to be gathered in future surveys, and geotechnical and other investigations (Executive Summary, p. iv).

The Developer further states that because the selected and alternative routes only differ slightly, the same communities will be affected; therefore, a separate assessment of the routes, with respect to social, cultural, and economic setting is not necessary (EIS, Section 1.4.2, page 11).

Request

1. Please provide a comparison of the potential environmental and socio-economic impacts among the highway route alternatives.
2. Please provide environmental, socio-economic, and technical evidence related to the effects of Alternative 3 so that an informed decision can be made by the EIRB regarding the remaining highway route alternatives.

IR Number: 3

To: The Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Alternatives to the Project (EIS, Section 2 and supplementary materials)

Preamble
The current Review is being conducted pursuant to the Inuvialuit Final Agreement (IFA) to satisfy requirements of that agreement and it is also a substituted Review for purposes of the *Canadian Environmental Assessment Act* (CEAA). Consequently, the Review must satisfy the requirements of both the IFA and CEAA. Section 16(e) of CEAA requires that alternatives to the project be considered as part of all panel reviews.

Request

1. Please indicate where in the Environmental Impact Statement or in the supplementary materials on the record for this proceeding the Developer has identified and considered the relative advantages, disadvantages and impacts of alternative means for providing improved transportation facilities to Tuktoyaktuk and the Inuvik region.
2. If this analysis is not currently included in the EIS please complete one and file it with the Board.

IR Number: 4

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Potential impacts from borrow pit sources (EIS, Section 1.5.1.1, p. 15; EIS Executive Summary, p. ix; EIS Section 3.1.1.3, p.105, Addendum to the Environmental Impact Statement for the Construction of the Inuvik to Tuktoyaktuk Highway, NWT, p.4-18)

Preamble

During some phases of construction, the Development will require the extraction of large quantities of borrow resources, and additional permits will be required. Although the potential borrow sources near Inuvik and Tuktoyaktuk have been ground-truthed and their spatial extent determined, many of the granular resources along the Primary 2009 Route are not proven and are described by the Developer as probable or prospective granular material resources whose existence and extent have been inferred. In the EIS, the Developer has acknowledged that additional site investigation is necessary prior to using these materials. The confirmation of additional borrow sites is ongoing. It is not clear how the environmental impacts (i.e., impacts to Valued Ecological Components (VECs)) from these as yet undefined borrow sites will be evaluated in the context of the Development and the EIS. It is understood that a final baseline report is expected by August 31, 2012.

Request

1. Please provide an update with respect to the ongoing delineation of potential borrow sites associated with the Development and provide rationale as to why borrow pits can be excluded from any detailed impact assessment in the EIS.
2. Please explain how the environmental impacts (i.e., impacts to VECs) from these as yet undefined borrow sites will be evaluated in the context of the Development, the EIS, and the Review given that the 'baseline' report will not be completed until August 2012.

IR Number: 5

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Water crossing – downstream impacts and connections to Husky Lakes (EIS, Section 3.1.7, p. 150 and Section 4.2.5, p.494)

Preamble

Although there is some discussion surrounding the 46 stream crossings and their overall impact assessment in the context of water quality and fish and fish habitat, it is not clear if or how potential downstream effects were assessed.

Request

1. Please explain how the potential development impacts downstream of water crossings and in the Husky Lakes will be assessed.
2. For monitoring of the effects of water crossings, indicate the parameters that will be measured, the locations of monitoring sites and the frequency of measurements.
3. Identify monitoring plans for Husky Lakes and indicate the parameters which will be used, the location of measurement sites, and frequency of monitoring to assess effects on the water quality in the Husky Lakes.

IR Number: 6

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Noise spatial boundaries (EIS, Section 3.1.4, p. 139 and Section 3.1.4.1, p.140, Section 3.1.4.5, p.142)

Preamble

The Developer states that *"The spatial boundary for noise is represented by the area in which effects are likely to occur. The local study area is considered to be within 0.5 km of the Highway center-line while the regional study area is defined by the area within 15 km of the Highway center-line."* No scientifically defensible rationale is provided to support the above assertions.

The Developer states that the *"Baseline sound levels have been recorded at the proposed Mackenzie Gas Project's Inuvik Area Facility which was considered representative of ambient sound levels along most of the pipeline corridor."* The Developer further states that sound levels at the survey sites were low and were consistent with remote environments, but no data originating from along the proposed Highway route have been provided. This suggests that no baseline noise levels were monitored along the proposed Highway route.

Request

1. Please provide a defensible rationale for the noise spatial boundaries selected in the context of the proposed Development and its location.
2. Please explain and justify your conclusion that sound levels along the proposed Highway route are consistent with remote environments.

IR Number: 7

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Construction noise (EIS, Section 3.1.4.2, p.140)

Preamble

The Developer claims that construction noise has traditionally been excluded from impact assessments because, although it can have great magnitude, it is usually temporary in nature. Yet no scientifically defensible rationale or concrete examples of the exclusion of construction noise in environmental effects assessment are provided to support the above assertions.

Request

1. Please provide a defensible rationale for excluding construction noise from the impact assessment in the context of the proposed Development and its location.
2. Please provide examples of major road or highway assessments where construction noise was excluded from the impact assessment and the associated rationale that was provided for doing so.

IR Number: 8

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Development Setting, Spatial Boundaries, Socio-economic Study Area(EIRB ToR, 2.4, 5.4; EIS Sec. 1.4, p.9; EIS Sec. 4.1.3.1, p.462-463; EIS Sec. 4.3, p.568; Table 4.3-1, p.568; Table 4.3-2, p.569)

Preamble

The EIRB ToR (5.4) requests the Developer to provide a general overview of the geographic, ecological, social, economic and cultural setting in which the development is proposed to take place, as well as to describe positive contributions at the local, regional, territorial and national levels (2.4).

The EIS (p.9) provides a general overview of Inuvik and Tuktoyaktuk. The EIS (p.462) states that "Local and regional spatial boundaries were determined for biophysical and socio-economic components based on their respective characteristics and anticipated interactions with Highway activities." The EIS (p.463) further states that the Human Environment Study Area "includes the communities of Inuvik and Tuktoyaktuk and the Inuvialuit that may be impacted by the proposed development", and defines the socio-economic study area as "…limited to the Town of Inuvik, the Hamlet of Tuktoyaktuk, and the land base between the two communities, including the Husky Lakes area" (p.568),

The EIS does not differentiate between a local study area (LSA) or a regional study area (RSA) for the socio-economic effects assessment. Throughout the assessment, however, references are made to regional effects. For example, Tables 4.3-1 (p.568) and 4.3-2 (p.569) present the assessment summary for the Valued Socio-economic Components and other Socio-economic Components, respectively. Under the column "*Affected Areas*" in each of the tables, "*ISR*" is included with Tuktoyaktuk and Inuvik.

Request

1. Please explain whether, and how, socio-economic effects were assessed at a regional level.
2. With regard to "…*the Inuvialuit that may be impacted by the proposed development*…" please explain how such impacts will be measured and monitored, and if necessary, mitigated, if these effects are outside the socio-economic study area.

IR Number: 9

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Valued Socio-economic Components (EIS, Executive Summary, p.ii**;** EIS, Sec. 4,3, p.568-609**;** EIS Sec. 4.1.2, p.461-462**;** Addendum to the EIS, Table 4, p.45-46; Developer Response to 2b and 2c, p. 80-131)

Preamble

The EIS (p.461) defines Valued Socio-economic Components (VSCs) as "Cultural, social, economic, or health aspects of the study population that, if affected by the project, would be of concern to local human populations or government regulators" (NEB 2011)." Table 4.1.2-1 (EIS p.462) lists the VSCs for the Human Environment, and Table 4.3-1 presents a summary of the assessment for these VSCs. Table 4.3-2 (EIS p.569) presents a summary of the predicted socio-economic effects for other socio-economic components assessed within the Human Environment Section.

The Valued Socio-economic Components listed in Table 4.1.2-1 are not inclusive of the range of predicted socio-economic effects as these are (1) outlined in the Executive Summary (EIS, p.ii), (2) identified and listed as spin-off socio-economic effects (EIS, p.573), and (3) defined by the NEB (2011, EIS, p.461).

Further, the Human Environment Assessment presented in the EIS (p.569-609) and the Developer Response to 2b and 2c (p.80-131) discusses the Development effects on a range of socio-economic topics (EIS Sec. 4.3-1 through 4.3-9). It is acknowledged that there is overlap and obvious relation between the VSCs and other Socio-economic Components, and the topics discussed and assessment presented in the EIS and Developer Response to 2b and 2c. However, it appears as though the assessment of effects on the VSCs in particular draws from more than one of the topics discussed in the EIS and Developer Response to 2b and 2c, and it is not immediately clear which information has been used in the determination of these effects.

Request

1. Please explain why the "Socio-economic Components" (EIS p.569) were not identified and considered as "Valued Socio-economic Components" (EIS p.568), especially given that many of the predicted effects of the Highway described on p.ii (EIS) and p.573 (EIS) pertain to the "Socio-economic Components".
2. Please explain whether, and how, the differentiation between "Valued Socio-economic Components" and "Socio-economic Components" determined the assessment of socio-economic effects.
3. For each of the VSCs listed in Table 4.3-1, please identify the relevant sections from (1) the EIS and (2) the Developer Response to 2b and 2c from which the assessment of effects on the VSCs is drawn.

IR Number: 10

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Determination of Impact Significance (EIS, Chapters 4 and 5)

Preamble
Chapters 4 and 5 of the EIS deal with Impact Assessment on Biophysical Components and the Human Environment Components of the environment in sections 4.2 and 4.3 respectively. Within those sections, a variety of subsections discuss and analyze various valued components of the ecosystem, review project activities, predict effects, set out mitigation measures, identify and assess the significance of residual effects. Specific references include sections 4.2.1; 4.2.2; 4.2.3; 4.2.4; 4.2.5; 4.2.6; 4.2.7; 4.3.8; 4.3.9; 4.4.5; and 5.4.1.

Request

With specific reference to the sections listed above please provide the following information:

1. Identify the scientist, engineer or technical expert primarily responsible for the impact evaluation for each section. If more than one person was involved in the determination of impact significance identify each of them and indicate which person was responsible for the final conclusion; and

2. Please file CVs for every person identified in the answer to question 1.

2.2 Project Description

Board IR Number: 11

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Use of Environmental Monitors

Preamble
The Developer has committed to use Environmental Monitors from the appropriate Hunters and Trappers Committee (HTC) in order to identify and then mitigate environmental effects of highway construction. These HTC Monitors are referred to in numerous sections and tables throughout the EIS as an important element of mitigation and environmental, especially wildlife protection plans.

Question

1. Please advise the Board of any specific arrangements made with affected HTCs. If an agreement has been reached please file a copy with the Board. If no agreement has been completed please indicate what plans the Developer has for negotiating such agreements and provide an outline of the proposed contents.

2. Please explain the roles and responsibilities of such HTC Monitors. Who will they report to? What authority will they have?

3. Please outline how any information collected by such Monitors will be used in the Developer's Adaptive Management Program. Will HTC Monitors play any role in compliance monitoring? If they will please explain.

IR Number: 12

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Wildlife management activities along the highway (EIS Section 4.2.7, p. 519 and EIS Executive Summary, p. xv)

Preamble

As summarized in the EIS by the Developer, the objectives of wildlife management activities along the proposed highway will be to mitigate potentially negative effects on wildlife in the following general ways:

- Minimize loss of habitat and reductions of habitat effectiveness via Project design;
- Minimize direct mortality due to collisions with vehicles;
- Reduce attractants at construction camps through responsible waste management and effective environmental awareness programs;
- Reduce the volume, duration, and frequency of noise producing activities;
- Selective timing of Project activities to avoid critical periods for wildlife;
- Conformance with pre-determined setback distances from key wildlife habitat features;
- Effective transportation, storage and disposal of wastes;
- Ensure Project personnel have appropriate levels of wildlife training and awareness; and
- Encourage organizations such as the Hunter and Trapper Committees, Wildlife Management Advisory Council and GNWT Department of Environment and Natural Resources to work together to develop guidelines and conditions for highway usage and follow-up with monitoring of harvesting activities.

According to the Developer, the GNWT DOT's operational policies are designed to mitigate potential impacts on wildlife and wildlife habitat. With the application of the numerous available mitigation measures described in the EIS, effects on wildlife and wildlife habitat are generally expected to be localized and limited and are considered to be minor in the context of the overall Development area.

In the absence of a detailed monitoring plan to assess the effectiveness of the proposed mitigation measures in the context of the proposed development, it will be difficult to assess the proposed mitigation measures and the resulting effects on wildlife and wildlife habitat in the context of the Review.

Request

1. Please explain and justify how the Developer proposes to determine the relative effectiveness of the wildlife management mitigation measures for the proposed development.
2. Please provide specific details with respect to how the 'success' of the proposed mitigation measures would be determined.

IR Number: 13

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Alignment Options (EIS Sec. 2.2, p.46-54; EIS Sec. 2.2.4, p.50)

Preamble

The Developer has undertaken a comparison of alignment options through an evaluation of environmental, economic, social, and technical factors. Sub-indicators are identified for each factor. Under the "*social*" factor, one of the sub-indicators is "*quality of life*". The EIS (p.50) defines this as follows:

> "*Quality of life includes both benefits and adverse effects on daily life of community members. Examples of expected benefits include new infrastructure, and better access to healthcare, education and training. Examples of potential adverse effects include increases in vehicular accidents, noise, dust, traffic, or Highway closures*."

The EIS (p.50) identifies all three alignment options as having equal benefits, and equal adverse effects with the exception of dust, potential for Highway closures, and risks to public safety. While Alternative 2 (Upland Route) is expected to generate the least amount of dust, the EIS concludes that it is the least favourable in terms of "*quality of life*" as it has a higher potential for Highway closures due to poor weather conditions and a higher risk of collisions due to topographical design challenges.

Request

1. Please provide a reference(s) for the definition of "*quality of life*" that was used in the EIS (p.50).
2. Please explain how the criteria for "*quality of life*" were identified and whether these criteria were confirmed with Inuvialuit residents from potentially affected communities.
3. Please explain and justify whether dust and noise from the other alignment options closer to Husky Lakes might also impact quality of life for those individuals using the area.

IR Number: 14

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Construction Camps (EIS Sec. 2.6.9, p.87)

Preamble
The EIS (p.87) states that "*The Project proposes a number of 15-20 person construction camps in the first year, although in the second year, at least one camp of greater than 50 persons may be added*."

Request

1. Please provide an estimate of the number of 15-20 person construction camps that would be required in the first year, and how many camps would be operational at any one time.
2. Please include the location of each camp and the timing of when these camps would be in each location.
3. Please provide an estimate of the number of 15-20 person construction camps that would be required beyond the first year of construction, and how many camps would be operational at any one time.
4. Please clarify whether the "*one camp of greater than 50 persons*" that may be added during the second year would be operational for subsequent construction years.

2.3 Existing Biophysical and Human Environment

IR Number: 15

To: The Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Baseline Data Collection Programs Schedule and Status (Addendum November 2011 Part D1 pages 1 to 6 Developers Response #2(b))

Preamble
In response to the EIRB deficiency request #2(b), issued to the Developer in a letter dated October 25, 2011, the Developer provided a table showing the proposed schedule and status of current and planned data collection programs (the "Reporting Schedule"), and an indication of how the Developer intended to use the information for the design and approval of the development proposal.

The data being collected is considered to be critical information as it informs the identification of environmental effects, the determination of the significance of the effects, and the design of specific mitigation and monitoring plans and programs. These are all key components of the EIS which is the primary focus of the Review. The following table identifies some of these critical data collection programs (information summarized from Developers response):

Program	Activity	Proposed Program Timing	Responsible	Status	Application in Project EA/Design/Planning/ Regulatory Applications
Terrain and Geotechnical	Draft Surficial Geology Map of LSA and borrow sites at 1:20,000 including delineation and classification of surficial geology.	March 1, 2012	Kavik-Stantec	Underway	Supports identification of potential wildlife habitat. Supports mitigation design and planning.
	Draft Terrain Constraints Map of LSA and potential borrow sites at 1:20,000 including delineation and classification of ice-rich deposits and terrain related geo-	March 1, 2012	Kavik-Stantec	Underway	Supports mitigation planning.

Program	Activity	Proposed Program Timing	Responsible	Status	Application in Project EA/Design/Planning/ Regulatory Applications
	hazards.				
Traditional Knowledge/ Traditional Land Use	Final Report (reporting of TK workshop results and analysis)	April 30, 2012	Kavik-Stantec		Used in mitigation confirmation and construction phase Wildlife Mitigation and Monitoring Plan.
Vegetation Baseline	Preliminary LSA vegetation cover map.	March 31, 2012	Kavik-Stantec		Used in field survey planning. Used to confirm impact predictions. Informs habitat potential mapping and wildlife field surveys.
	Vegetation cover and Rare Plant Field Surveys and Sampling	June 2012	Kavik-Stantec		Used in vegetation mapping and to confirm EIS vegetation typing. Used in final design and mitigation determination.
	Draft Report including vegetation cover map at 1:20,000 and rare plant occurrences	August 15, 2012	Kavik-Stantec	Revised Schedule	Used in wildlife habitat mapping.
Wildlife and Wildlife Habitat	LSA features relevant to wildlife	March 31, 2012	Kavik-Stantec	Revised Schedule	Used in refining construction phase Wildlife Mitigation and Monitoring Plan. Used in design and implementation of habitat mitigations.
	Spring waterfowl staging survey	May 2012	Kavik-Stantec in consultation with EC		Used in refining construction phase Wildlife Mitigation and Monitoring Plan. Used in design and implementation of habitat mitigations.
	Breeding waterfowl survey	June 2012	Kavik-Stantec in consultation with EC		Used in refining construction phase Wildlife Mitigation and Monitoring Plan. Used in design and implementation of species mitigations.
	Breeding passerines/ shorebirds	June / July 2012	Kavik-Stantec in consultation		Used in refining construction phase Wildlife Mitigation and Monitoring Plan.

Program	Activity	Proposed Program Timing	Responsible	Status	Application in Project EA/Design/Planning/ Regulatory Applications
	survey		with EC		Used in design and implementation of species mitigations.
	Draft Report including wildlife habitat features and observations map at 1:20,000	August 15, 2012	Kavik-Stantec	Revised Schedule	Used in design and implementation of species mitigations. Used in refining Construction Wildlife Mitigation and Monitoring Plan
	Raptor nest survey	June 2012	ENR - Inuvik		Used in design and implementation of habitat mitigations.

According to the most recent review schedule issued by the EIRB on December 19, 2011, the Technical Review phase is scheduled to be completed by early April 2012 and the Public Hearings are scheduled for June 2012.

Request

1. Given the current Review schedule and the identified Reporting Schedule for the baseline data collection programs, please explain how this information could be factored into an EIRB decision.

2. A monitoring program developed prior to construction but after the completion of the Review is not helpful to the Board's determination of impacts. Please review your commitments table, the EIS and supplementary materials and provide the Board with a comprehensive list of monitoring commitments and plans. Indicate the earliest dates when those plans could be provided to the EIRB.

IR Number: 16

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Project impacts to fish and fish habitat and mitigation (EIS Section 4.2.5.1, p. 495 and Table 4.2.5-1, p. 497)

Preamble

The Developer has predicted that with the application of the available mitigation measures, effects on fish and fish habitat are generally expected to be localized and limited and are considered to be minor in the context of the overall Development area. However, it is not clear how the proposed mitigation measures will be evaluated or measured with respect to their relative effectiveness or success. No specific contingency plans are apparent, and there is no discussion of how an Adaptive Management Plan would be applied should mitigation measures prove to be ineffective.

Request

1. Please identify and discuss how the effectiveness of the proposed mitigation measures will be evaluated or measured.
2. Please identify how and when site-specific contingency plans will be developed.
3. Please describe how an Adaptive Management Plan for the development could be applied should mitigation measures prove to be ineffective.

IR Number: 17

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Baseline data – Current Conditions (EIS Section 3.0, p.99)

Preamble

The Developer states that the *"Baseline data represent current conditions, to the extent possible."* (emphasis added). The apparent 'disclaimer' pertaining to baseline data warrants further explanation and clarification from the Developer in the context of the proposed Development and VECs.

Request

1. For all VECs, please indicate and explain where baseline data is and is not representative of current conditions.
2. Please include the date(s) or range of dates of the data or information used to represent 'current conditions' for each VEC assessed in the EIS.
3. Please confirm whether the baseline data used to represent current conditions are specific to the LSA and/or the RSA.

IR Number: 18

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Baseline data - Terrain (EIS Section 3.1.1.2, p.102 and Table 3.1.1.1-1, p. 102-103)

Preamble

In the Developer's description of terrain units along the proposed Highway routes, it is stated that highway routing focused on traversing the most favourable terrain with minimal footprint size, but no specific description of 'favourable terrain' is provided other than a reference to avoiding thick organic and ice-rich polygonal terrain, "where possible". With the absence of this information, it cannot be determined exactly what is meant by 'favourable terrain' or how much thick organic and ice-rich polygon terrain will potentially be disturbed by the proposed Development. Table 3.1.1.1-1 summarizes the terrain units along the Primary 2009 Route, but there is no link of potential development impacts to thick organic and ice-rich polygonal terrain.

Request

1. For all current Highway route alternatives being considered, please provide a definition of 'favourable terrain'.
2. For all current Highway route alternatives being considered, please provide an estimate of how much thick organic and ice-rich polygon terrain will be disturbed.
3. For all current Highway route alternatives being considered, please provide a map and a description of the locations of favourable terrain and the organic ice-rich polygon terrain.

IR Number: 19

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Climate data (EIS Section 3.1.2, p.114 and Tables 3.1.2-1 through 3.1.2—4, p. 114-119)

Preamble

Climate data from two meteorological stations operated by Environment Canada, Tuktoyaktuk-A and Inuvik-A were used by the Developer for the discussion of climate for the Inuvik and Tuktoyaktuk areas. Inuvik climate normal's between 1971-2000, and 1976-2005 were summarized in Tables 3.1.2-1 and 3.1.2-2, respectively. Tuktoyaktuk climate normal's between 1971-2000 and 1978-2007 were summarized in Tables 3.1.2-3 and 3.1.2-4, respectively. The Developer states that each station can be assumed to generally represent a radius of 10 km, although the actual area of representation is dependent on local geography and that the terrain located within a 10 km radius of the Tuktoyaktuk-A and Inuvik-A weather stations is representative of what is present along the entire route and therefore the climatic data is generally representative of the entire route (presumably the Preferred 2009 Alternative). However, it is not clear how the Developer evaluated representative habitat, topography, terrain, etc. along the entire route as no actual quantitative habitat comparison was presented in this Section in the context of climate.

Request

1. Please explain, using supporting rationale and/or empirical data (i.e., modelling), that the habitats within a 10km radius of each respective weather station are representative of what is present along the entire proposed Highway route.
2. Please explain what parameters or criteria are being used as the basis of this qualitative comparison.
3. Please demonstrate that climate data is representative of what is present along the entire proposed Highway route.

IR Number: 20

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Climate change data (EIS Section 3.1.2.9, p.125)

Preamble
With respect to climate change the Developer states:
"Natural variability, expressed as averages over the last 30 years, shows variations in average annual temperatures of 3˚C to 6˚C in the Mackenzie Delta. Depending on the climate model scenario used, these exceed (by two to three times) the average annual temperature increases obtained from the model. Nonetheless, based on observed trends and future modeled predictions, there is a consistent and gradual warming trend. Generally, modeling results indicate a warming trend in air temperature of up to 2.5˚C and an increase in precipitation of up to 11.8% in the 30 years between 2010 and 2039 (IOL et al. 2004)."

The model introduced here by the Developer is apparently that generated by Imperial Oil Limited in support of the Mackenzie Gas Project regulatory application. No background information pertaining to the climate change model is apparent in the EIS and the accuracy of the model is not discussed in the context of the proposed development.

Request

1. Please provide all relevant supporting background materials with respect to the model used in the EIS.
2. Please provide a detailed accuracy assessment of the model.

IR Number: 21

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Air quality - dust (EIS Section 3.1.3, p.126 Table 3.1.3-1 p. 130, Section 3.1.3.5, p. 130 and Section 3.1.3.5, p. 133)

Preamble

As noted by the Developer, territorial and federal regulatory agencies have established standards and objectives to which ambient measurements are compared to determine the air quality. ENR maintains and operates the NWT Ambient Air Quality Monitoring Network, consisting of four monitoring stations located in Yellowknife, Inuvik, Fort Liard and Norman Wells. Each station is capable of continuously sampling and analyzing a variety of air pollutants and meteorological conditions. To establish a baseline for consideration of ambient air quality conditions expected to occur in the Development area, the Developer conducted a review of ambient air quality monitoring data for the Inuvik area (emphasis added). The Developer does not discuss or explain how air monitoring results from the Inuvik area are representative of air quality conditions along the proposed Highway route. It is not clear how the Inuvik baseline will act as a foundation for future monitoring programs, if any, along the proposed Highway route. The primary concerns appear to be with fine and coarse particulate matter ($PM_{2.5-10}$ /or dust) and, to a lesser extent, the potential acidification of proximate vegetation.

Request

1. Please explain and justify how air monitoring results from the Inuvik area could be representative of air quality conditions along the proposed Highway route.
2. Please explain and describe how the effects of dust will be monitored and minimized or eliminated in the context of the proposed Development.
3. Please explain, using quantitative examples or models, how dust may affect water quality in watercourses that are affected by dust.

IR Number: 22

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Vegetation baseline data: rare plants, vegetation types of concern and harvested plants (EIS, Section 3.1.8.4, p.207, EIS, Section 3.1.8.5, p.210, EIS, Section 3.1.8.6, p.210 and Addendum to the Environmental Impact Statement for the Construction of the Inuvik to Tuktoyaktuk Highway, NWT, Section 2.7.7.6, p. 20)

Preamble

The Developer briefly describes and acknowledges the possibility that the Development may negatively impact rare plants, vegetation types of concern (distinct assemblages of plant species, often found under particular environmental conditions) and harvested plants. However, field surveys for vegetation community types and rare plants potentially directly impacted by the proposed Development were not scheduled to begin until 2011 and 2012, respectively. This was after the submission of the development EIS.

Request

1. Please discuss how the information being gathered will impact the current EIS predictions and any future monitoring programs.
2. Please indicate when the Developer will inform the public and other stakeholders what is to be expected in terms of the loss of rare plants, vegetation types of concern (and general vegetation community types) and harvested plants.
3. Please indicate what mitigation may be possible to reduce impacts on rare plants, vegetation types of concern and harvested plants if this information is not available until after the completion of the Review.

IR Number: 23

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Barren-ground caribou observations (EIS Section 3.1.9.5, p.218 and Figures 3.1.9-3 - 3.1.9-4)

Preamble

With respect to winter-spring, spring migration and pre-calving caribou observations and herd ranges, the caribou observations presented appear to depict heavy concentrations of observations between roughly kilometre 110 and kilometre 120 of the proposed Highway route. Highway construction may result in this area becoming more dangerous for caribou, if they do not avoid the area entirely.

Request

1. Please explain and justify the potential implications for caribou using this area after highway construction.
2. Please include discussions surrounding mortality, avoidance and habitat fragmentation along with any other potential impacts.

IR Number: 24

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Potential impacts to moose (EIS, Section 3.1.9.6, p.239 and Section 4.2.7.4, p. 539)

Preamble
In September 2009, during an aerial reconnaissance along the proposed Highway alignment, a total of 16 moose were observed including seven bulls, five cows, three yearlings and one calf. The Developer states that the overall effect of habitat loss to moose from the proposed Highway and the proposed gravel borrow sources should be considered to be very small and insignificant and will not affect the population at the local level. However, beyond a few coarse habitat loss estimates there is no information provided to support this statement. And, no quantitative estimates are provided with respect to moose 'populations' at the local level.

Request

1. Please explain and justify the stated conclusions about impacts to moose populations.

IR Number: 25

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Spring 2010 aquatic field program (EIS, Appendix C)

Preamble

The Developer states, based on the Spring 2010 aquatic field program, that the majority of stream channels to be crossed by the proposed Highway, other than those included in the detailed fish and fish habitat surveys, were assessed to be small, ephemeral streams that generally drain terrestrial upland areas or small, shallow lakes or ponds, most of which do not provide suitable fish habitat features. Although fish surveys have been conducted previously in streams and within the Husky Lakes system along the proposed Highway route (as summarized in Rescan (1999a), Roux et al. (2010), Perrin (2007) and the Environmental Impact Statement (EIS) for the Mackenzie Gas Project (IOL et al. 2004)) it is not clear if these surveys are representative of the 46 streams that will be crossed by the proposed Highway, or how they relate to the Spring 2010 aquatic field program as these earlier studies are not referenced.

Request

1. Please explain, and provide dates when all of the necessary aquatic field data will be provided to the EIRB so the aquatic effects assessment provided in the EIS can be properly evaluated for this Review.

IR Number: 26

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Disturbance to birds (EIS, Section 4.2.7, p. 519)

Preamble
The Developer states that the majority of disturbances to birds will be of a temporary nature. And that disturbance effects experienced by birds during construction (and supposedly the operation) of the proposed Highway and the physical existence of the proposed Highway afterwards are not anticipated to affect the bird populations at the local or regional level.

Request

1. Please explain and justify the conclusion that disturbance effects experienced by birds during construction and operation of the proposed Highway are not anticipated to affect the bird populations at the local or regional level.

IR Number: 27

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Employment Demographics (EIS Sec. 3.2.4.1, p.307)

Preamble

The EIS (p.307) states that "*In both the NWT and Inuvik, the age group with the highest employment rate was 35-44.*" In Figure 3.2.4-11, the age group with the highest employment rate in the NWT is depicted as 45-54.

Request

1. Please confirm which age group, either 35-44 or 45-54, has the highest employment in the NWT.

IR Number: 28

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Housing (EIRB ToR, Sec. 9.2 EIS Sec. 3.2.5.11, p.349)

Preamble

The EIRB ToR requests that the EIS describe "*current levels of use of existing social, institutional, family, health and community services and local, regional and territorial infrastructure and the capacity of these to meet current, additional and new needs*" with particular attention given to "*housing stock, costs, and availability.*" Section 3.2.2.4 of the EIS presents information on the number of households in Inuvik and Tuktoyaktuk, and the average number of people per household. This information is repeated in Section 3.2.5.11 (Infrastructure and Institutional Capacity). It does not, however, present information on the availability of housing (i.e. levels of demand) and housing costs. This information is necessary in order to measure change in the levels of housing availability or cost that may be attributable to the development.

The Developer estimates that with additional training, approximately 70% of the construction workforce may be from local communities (EIS, Section 4.3.1.1), and further, that local workers from Tuktoyaktuk and Inuvik "…*will continue to live in their own houses and will be accommodated at the construction camps during their work schedules*" (Developer Response to 2b and 2c, Section 12.1). To mitigate potential effects to Tourism, Commercial and Public Recreational Use, the Developer states that it will accommodate winter construction crews in camps (EIS, Table 6-1). However, it is also stated (Developer Response to 2b and 2c, Section 12.1) with regard to Housing, that *"The Developer has not made commitments for this component."*

Request

1. Please provide information on housing costs and housing availability in Inuvik and Tuktoyaktuk.
2. Please indicate whether the development is anticipated to create new demand for housing in Inuvik or Tuktoyaktuk, and whether there is available housing to respond to this demand.

2.4 Biophysical and Human Impact Assessment

IR Number: 29

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Caribou habitat fragmentation (EIS, Section 3.1.9.5 p. 218, Section 4.2.7.2, p. 520 and Table 4.2.7-3)

Preamble

The proposed highway alignment is located south of the traditional summer and fall caribou harvesting areas, but within the spring and winter caribou harvesting areas. As well, the alignment occurs within the Bluenose-west winter range management area. This area provides important winter habitat for the Bluenose-West caribou herd, which is valued for subsistence harvesting year-round by Inuvialuit communities and other Aboriginal communities outside the ISR.

As stated by the Developer, caribou habitat could be lost, fragmented, or degraded as a result of the proposed development. However, the Developer does not appear to have carried out any type of habitat fragmentation analysis as part of the assessment of impacts to caribou. No rationale is provided for this apparent omission, despite acknowledging that habitat fragmentation, as a result of the proposed development, could impact caribou. As a result, the Developer's residual effects assessment for caribou and caribou habitat in the RSA may be underestimating (qualitatively) the potential impacts to caribou.

Request

1. Please explain why habitat fragmentation analysis was not completed for this EIS.
2. Please provide statistically derived confidence limits for your predictions.

IR Number: 30

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Air quality impact assessment (EIS, Section 4.2.2, p. 470)

Preamble
The Developer states that the focus of the air quality assessment is on predicting changes in air quality concentrations; however, such changes are only monitored regionally, in Inuvik, and not at any points along the proposed Highway routes.

Request

1. Please explain and justify how the measurement of air quality parameters in Inuvik is representative of air quality along the proposed Highway route.

IR Number: 31

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Air quality impact assessment - dust (EIS, Section 4.2.2.4, p. 476)

Preamble

The Developer anticipates that the largest effects to vegetation ecosystems and plants from fugitive dust will occur within 100 m of a dust source; however, they also acknowledge that the potential range of negative impacts from dust on vegetation can range between 100 m to 400 m. It is not clear why the apparent low-end of the range for known dust impacts to vegetation was selected for purposes of the impact assessment

Request

1. Please explain and justify why the apparent low-end of the known range for dust impacts to vegetation was selected for purposes of the impact assessment.

IR Number: 32

To: Developer

Subject: Increased access to fisheries resources during Project operations (EIS, Section 4.2.5.1 - 4.2.5.3, p. 503-504)

Preamble

The Developer has identified that the greatest potential indirect impact from Highway construction is the potential increase in fish harvest pressure through domestic and sport fishing. This is due to the improved access that will be afforded by the Highway to important, but remote, fish harvest areas in some of the lakes along the proposed Highway, as well as the numerous watercourse crossings. Although the Developer recognizes that extensive consultation and public "buy-in" is required to minimize resource depletion and associated anthropogenic disturbances, the Developer also states that there may well be residual effects to fisheries resources because of improved access. Relying on extensive consultation and public 'buy-ins' is the basis for the Developer anticipating no significant adverse residual effects to fish and fish habitat. However, it is not clear how this will be accomplished or who will be responsible for carrying out any public consultation or action plan as outlined in the EIS.

The Developer has identified that the Development may result in residual effects on fish or fish habitat. However, the Developer anticipates that these effects are expected to be minor and will not significantly reduce the productive capacity of fish habitat within "*the area*".

Request

1. Please explain whether public consultation or an action plan for minimizing the potential impacts to fisheries resources that could potentially occur as a result of the proposed development is the proposed mitigation for any residual effects on fish or fish habitat.
2. If so, please provide the detailed plan. Please include methods for assessing the relative success of any public consultation or action plan.
3. If such a plan will not be developed, please explain and justify what mitigation is proposed to mitigate any potential residual effects on fish or fish habitat.
4. Please define what is meant by the phrase "*the area*" as used above.
5. Please clarify and explain how the Developer proposes to limit access in order to minimize impacts to fisheries resources.

IR Number: 33

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Caribou habitat loss (EIS, Section 4.2.7.2, p. 520)

Preamble

The Developer provides some coarse estimates of 'habitat' loss for caribou by calculating how much of the herd ranges are directly removed by the development footprint, and reporting these numbers as percentages of the RSA. What appears not to have been provided is information on: zones of influence (ZOI) in these estimates; percentages of herd ranges lost in the LSA (where the greatest impacts to caribou will likely occur); and quantitative information about road avoidance or attraction by caribou. The Developer assumes that caribou will generally avoid the proposed Highway due to sensory disturbance, though some degree of habituation may occur. The degree of avoidance is likely to be higher once construction is complete and regular vehicle traffic commences. No quantitative estimates surrounding the degree of avoidance are provided by the Developer.

Request

1. Please provide and justify estimates of habitat loss in the LSA for caribou and incorporate an appropriate ZOI into the coarse calculations of habitat loss.
2. Please provide and justify a quantitative estimate surrounding the degree of Highway avoidance by caribou.
3. Provide data collected by GNWT Department of Environment and Natural Resources that shows caribou responses to roads or other anthropogenic disturbances.

IR Number: 34

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Caribou mortality (EIS, Section 4.2.7.2, p. 523)

Preamble
The Developer acknowledges that caribou mortality could increase due to vehicular collisions and increased hunting as a result of enhanced hunter access. However, no quantitative mortality estimates are provided to support this statement. Although the implementation of hunting restrictions and other proposed mitigation measures could be used to minimize the effects of hunting on caribou, it is currently not possible to determine whether or not such initiatives would be successful as there is no way to gauge their relative success.

Request

1. Please provide quantitative estimates of caribou mortality from all sources in the LSA as a result of the proposed Development.
2. Please describe the range of wildlife management options available to limit harvesting within road corridors.
3. Please indicate where the identified options (in #2 above) have been used and how successful they have been.
4. Please explain and justify whether no-hunting corridors could be used as a mitigation measure.
5. Please identify, explain and justify what thresholds would be applied to the proposed development corridor to establish a no hunting or shooting corridor.

IR Number: 35

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Grizzly bear habitat loss (EIS, Section 4.2.7.3, p.529)

Preamble

The Developer provides coarse estimates of 'habitat' loss for grizzly bear by calculating how much 'wetland habitat', 'riparian zones' and 'berry producing habitat' are impacted by the Development's direct footprint and reporting these numbers as miniscule percentages of the RSA. What is not included or justified are: ZOIs in their estimates; percentages of habitat lost in the LSA (where the greatest impacts to grizzly bears will likely occur); and whether road avoidance or attraction by grizzly bears will occur. No quantitative estimates surrounding the degree of Highway avoidance are provided by the Developer.

Request

1. Please provide estimates of habitat loss in the LSA for grizzly bears and incorporate an appropriate ZOI into the coarse calculations of habitat loss.
2. Provide a quantitative estimate surrounding the degree of Highway avoidance by grizzly bears.
3. Based on this information, please explain and justify your statement that direct footprint impacts will not significantly affect grizzly bear.

IR Number: 36

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Grizzly bear and furbearer den sites – proposed effects management (EIS Section 4.2.7.3, p. 529 and Addendum to the Environmental Impact Statement for the Construction of the Inuvik to Tuktoyaktuk Highway, NWT, Section 2.7.7.7, p.22)

Preamble

The Developer states that if active grizzly bear dens (and dens of furbearers) are discovered within 500 m of Development sites, the ENR will be contacted immediately to determine the appropriate course of action. Activities may be temporarily suspended pending consultation with ENR.

Request

1. Please provide a defensible rationale for selecting what appears to be a 500 m ZOI for denning grizzly bears and furbearers in the NWT in the context of the proposed development.
2. Please explain and justify whether the Developer expects the number and location of grizzly bear dens and furbearers to fluctuate after Development construction within this 500 m ZOI in comparison to current conditions.
3. Please provide the results of the October 2011 den survey along the 2009 Preferred Route.
4. Please explain and justify the course of action that may result should an active grizzly bear or furbearer den be discovered. (This should be part of the Wildlife Management Plan for the development.)

IR Number: 37

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Grizzly bear habitat fragmentation (EIS Section 3.1.9.12, p.259)

Preamble

As briefly discussed by the Developer, habitat fragmentation may or may not be an issue for wildlife species (such as Grizzly bear). The Developer states: *"Historic human-caused disturbances to vegetation in the Regional Study Area were limited to small sites or resulted in minimal impacts. The level of fragmentation and connectivity are considered to be insignificant."* No scientifically-defensible rationale has been provided to support this claim and it does not appear that any type of habitat fragmentation analysis was completed as part of the assessment of impacts to grizzly bear. As a result, the Developer's residual effects assessment for grizzly bear and grizzly bear habitat in the RSA may be underestimating (qualitatively) the potential Development impacts to grizzly bear.

Request

1. Please provide a habitat fragmentation analysis for grizzly bear with associated supporting rationale for the approach taken (i.e., what is being fragmented, what is the scale of fragmentation, what is the extent of fragmentation, what is the mechanism causing fragmentation).
2. In the absence of completing a habitat fragmentation analysis, please explain and justify the conclusions in the EIS about impacts on grizzly bears using some other accepted method.

IR Number: 38

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Traffic volumes and traffic-wildlife mortality (EIS Section 2.8, p.97 and Table 5.4.1-1, p. 644)

Preamble
The Developer states that wildlife-interactions over the life of the proposed Development will not be significant as the traffic will be "*relatively minimal*" (150-200 vehicles per day), which will reduce the risk of potential traffic-related mortality of wildlife. Further, the Developer has committed to posting signage that will warn of potential wildlife crossings in areas where wildlife are known to frequent (i.e., known migration corridors). However, it is not clear how the Developer arrived at the conclusion that 150-200 vehicles per day in an area where winter road annual daily traffic is only approximately 139 vehicles per day can be classified as being "*relatively minimal*" and how this new, increased level of traffic will reduce the risk of potential traffic-related mortality of wildlife, as indicated. Further, the locations of wildlife crossing signage are not apparent.

Request:

1. Please explain and justify how traffic volume estimates reduce the risk of potential traffic-related mortality, as indicated.
2. Please provide the approximate locations of wildlife crossing signage, if potential wildlife crossing areas are known.

IR Number: 39

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Tourism Opportunities and Increased Traffic (EIS Section 2.8, p.97; EIS, Sec. 4.3.2.1, p.578**;** EIS, Appendix F, p.22)

Preamble
The EIS states that —*GNWT DOT (2010) estimates that the total number of tourists to visit the Inuvik Beaufort-Delta region would increase by about 10% to 5,500 tourists per year with the construction of the highway.*

Request

1. Please explain what this estimate is based on.
2. Please provide estimated levels of tourism for each season, including details regarding anticipated mode of travel.
3. Please confirm whether the estimated increase in traffic volumes (150-200 vehicles per day from the current level of 139 vehicles per day) includes traffic from tourism.

IR Number: 40

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Project Employment by Skills Category (EIRB ToR, Sec. 10.2.2**;** EIS, Sec.3.2.4.3, p.329**;** EIS, Sec. 4.3.2.1, p.572**;** EIS, Sec.4.3.2.2, p.581)

Preamble

The EIRB ToR (10.2.2) requests the Developer to provide the following information: "*Employment and income for every year of construction and operation, with particular reference to wage and salary employment by length of employment, form of employment (full time, part-time, seasonal), skills category,…*".

The EIS (p.572) states that "*Highway construction will create 1,086 one-time jobs in the NWT and another 860 one-time jobs in the rest of Canada. In addition, Highway construction is expected to create 42 long-term jobs in the NWT and another nine in the rest of Canada*."

In terms of the skills categories, the EIS (p.329) states that "*a variety of positions will likely be available for the Highway Project, including supervisors, environmental and wildlife monitors, scouts, clerks, engineers, construction staff, labourers, heavy equipment operators, heavy duty mechanics, camp staff, and a variety of other positions*." The EIS (p.581) further states that "*The number of workers required by occupation or skill will be determined during the detailed design phase of this Project. Typical types of work and skills involved in highway construction include: surveying, environmental and wildlife monitoring, environmental field studies, heavy duty equipment operators, truck drivers, heavy duty mechanics, and camp personnel.*"

Request

1. Please identify all development-related positions by skills category.
2. Please provide an estimate of the wages for these positions.
3. Please provide an estimate of the number of jobs per skills category.

IR Number: 41

To: The Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Education and Training as it Relates to Project Employment (EIRB ToR, Sec. 9.2; EIS, Sec.3.2.4.3, p.329-330; EIS, Sec. 4.3.1.1, p.569; EIS, Sec.4.3.2.2, p.582; EIS Sec.4.3.3.1, p.583)

Preamble

The EIRB ToR (9.2) requests the Developer to "*Describe the timing and duration of education and skills development programs that would be required for Project-related employment*."

Table 3.2.4-5 (p.329-330) lists the Aurora College Programs that are offered at Inuvik as these relate to the various NWT Occupation Categories, but these are not directly related to potential Development employment. The EIS (p.569, 581) states that "*During the Tuktoyaktuk to Source 177 Access Road construction, approximately 70% of the workers were from local communities. It is estimated that with additional training, a similar percentage may be achieved for the Inuvik to Tuktoyaktuk Highway*" (p.569, p.582). The EIS (p.583) further states that "*In anticipation of upcoming construction work, residents seeking employment may enrol in applicable training programs at Aurora College. As well, several training programs were set up specifically for the construction of the Tuktoyaktuk to Source 177 Access Road and similar training programs could be made available in association with this project.*" Table 4.3.2-8 presents the potential available labour supply (2009) for Inuvik and Tuktoyaktuk. It is noteworthy that 59.3% of the Inuvik potential labour supply and 73.8% of the Tuktoyaktuk potential available labour supply are within the "*Less than High School Diploma*" category.

Request

1. Please indicate the education, training, skills, and other requirements that are necessary to take advantage of development-related employment opportunities.
2. Given that over half of the potential labour supply are in the "*Less than High School Diploma*" category, please indicate what type of additional training would be required for the available labour supply to take advantage of employment opportunities (in the various categories of jobs), and when the additional training will need to be completed in order for interested and available candidates to take advantage of employment opportunities.
3. Please describe any efforts that have been made to provide information regarding development-related employment and the necessary training requirements to the available labour supply in Inuvik, Tuktoyaktuk, and elsewhere in the region.
4. With respect to the following statement: "*During the Tuktoyaktuk to Source 177 Access Road construction, approximately 70% of the workers were from local communities*", please confirm whether "*local*" refers to Inuvik and Tuktoyaktuk, ISR communities, or NWT communities.
5. With respect to the statement "…*similar training programs could be made available in association with this project*" please describe in detail any plans the Developer has to set up similar training programs.

IR Number: 42

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Tourism Opportunities (EIS, Sec. 4.3.2.1, p.578**;** EIS, Appendix F, p.22)

Preamble

The EIS states that "*GNWT DOT (2010) estimates that the total number of tourists to visit the Inuvik Beaufort-Delta region would increase by about 10% to 5,500 tourists per year with the construction of the highway.*"

Request

1. Please explain what this estimate is based on.

IR Number: 43

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Human Health and Community Wellness – Case Studies (EIS, Sec. 4.3.5, p.591-593)

Preamble
The EIS (Section 4.3.5, p.591-593) provides a description of some of the potential effects of the Highway on individual, family, and community wellness.

Request

1. In assessing the potential impacts of the development on individual, family, and community wellness, did the Developer draw upon the assessments and post-construction experiences of other remote communities to which an all-weather road has been constructed and in operation?
2. If yes, please provide a list these communities and projects, and describe how those assessments and the subsequent experiences informed the assessment and proposed mitigation for the development.

IR Number: 44

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Human Health and Community Wellness (EIS, Sec. 4.3.5, p.591-593; Addendum to the EIS, p.59; Developer Response to 2b and 2c (Sec.13))

Preamble

The EIS (Section 4.3.5, p.591-593) provides a description of some of the potential effects of the Highway on individual, family, and community wellness, in particular, the potential impact of increased income (from employment) on substance abuse. It provides a general description of potential positive impacts of the Highway on the community of Tuktoyaktuk (i.e. easier, lower-cost, and year-round access to the Inuvik primary health center.

The Addendum to the EIS (p.59) provides additional details, and states that contractors hired to construct the Highway will be required to (1) have employment policies related to alcohol and drugs on the job site, and (2) comply with all applicable legislation related to employment.

The Developer response to 2b and 2c provides further explanation of expected effects, noting that a primary concern of stakeholders is that the Highway may increase Tuktoyaktuk residents' access to alcohol. The response identifies parties responsible for addressing alcohol and substance related issues in the community, in this case, the Hamlet of Tuktoyaktuk and community wellness and support workers.

Request

1. Please explain whether, and how, the enforcement of alcohol restrictions would respond to changes in access to alcohol.
2. Please describe any policies, with regard to alcohol and other substances that will be implemented for employees residing in construction camps.
3. Please provide further details on the Developer's and any contractor's policies with regard to employment as such policies pertain to alcohol and substance abuse on the job site (i.e. zero tolerance).

IR Number: 45

To: The Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Human Health and Community Wellness - Harvesting (EIS Sec. 4.3.5, p.593**;** EIS Sec. 4.3.7, p.595)

Preamble

The EIS (Human Health and Community Wellness Section, p.593) states that "*the presence of the highway may increase access to harvesting areas that were previously more difficult to access. The effects from increased access to harvesting areas include increased food security and reduced reliance on store-bought food. Further discussion regarding harvesting and access to harvest areas is found in Section 4.3.7*." The EIS (Harvesting Section, Sec. 4.3.7, p.595) repeats the statement that "*increased access could result in increased harvesting activities, which may provide increased access to country foods, increased food security, and reduced cost of living through less reliance on store-bought food. The potential effects related to wildlife from increased harvesting are discussed in Section 4.2.7 (Wildlife and Wildlife Habitat)*".

The EIS appears to assert that increased access to harvesting areas is a positive, direct effect of the Highway on harvesting. However, the ability to harvest may also be directly affected by the Highway through changes in the health (quality) and abundance (quantity) of harvested species.

Request

1. Please explain and justify how the Highway is expected to result in a change in the quality and abundance of harvested species that, while it may not be "significant" from a biophysical assessment perspective, would result in a direct benefit to harvesters.
2. Please provide case study examples of road and Highway projects that have resulted in a long term net positive effect to harvesting (i.e. same or increased levels of harvesting) through increased access to harvesting areas.

IR Number: 46

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: IFA and CCP Goals - Land Use (EIRB ToR, Sec. 9.2; EIS Sec. 3.2.3.2, p.297 **;** EIS Sec. 3.2.9.3, p.432-433**;** EIS Sec. 4.3, p.568**;** EIS Sec. 4.3.8, p.597-606)

Preamble

The EIRB ToR (9.2) requests that the Developer "*Provide a description of the local and regional economies and their performance, including: local and regional economic development goals and objectives as identified in public consultations, the Inuvialuit Final Agreement (IFA), Community Conservation Plans (CCPs)*."

The Baseline Section of the EIS (p.297-298) lists the three basic goals of the IFA, as well as the five goals upon which the overall strategy for conservation and resource management is based in the Inuvik and Tuktoyaktuk CCPs, and further (p.432-433) describes the "*Land Management Categories*" and "*Areas of High Conservation Value/Ecological Sensitivity or Importance*" as these are described in the CPPs.

Table 4.3-1 (p.568) presents the assessment summary for the VSCs. For the "*Land Designation Areas* (*as per the IFA and CCPs)*" the potential effect is assessed as "*adverse*", while the potential effect for the "*Areas of Special Ecological and Cultural Importance*" VSC is assessed as "*neutral*".

Request

1. Please provide an explanation as to how potential effects on the "*Land Designation Areas (as per the IFA and CCPs)*" VSC is "*adverse*", while the potential effect on the "*Areas of Special Ecological and Cultural Importance*" VSC is "*neutral*", given that some of the goals of the IFA and CCPs pertain to protection of such areas of ecological and cultural importance.
2. Please indicate whether any meetings have been held, or will be held, with the Inuvialuit organizations (i.e. Hunters and Trappers Committees, Community Corporations, WMAC, FJMC) that drafted and approved the CCPs in order to discuss and reconcile the Project's proposed use of Zone E which is defined in the CCPs as an area where no development should take place.

IR Number: 47

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Land and Resource Use - Traditional Culture (EIS, Table 4.3-1, p.568**;** EIS, Table 4.3-2, p.569**;** EIS, Section 4.3.7, p.595)

Preamble

The EIS (Table 4.3-1) summarizes the effect of the Highway on "*Land and Resource Use by the Inuvialuit*" as both beneficial and adverse, and on "*Land Designation Areas (as per IFA and CPPs)*" as adverse. The EIS (Table 4.3-2) summarizes the effect of the Highway on "*Traditional Culture*" as beneficial, and states (p.595) that "*The presence of the highway will create year-round access to harvesting areas that were previously accessible only during certain seasons*." Despite the increased access to harvesting areas that the Highway will provide, it is unclear how adverse effects on "*Land and Resource Use by the Inuvialuit*" and "*Land Designation Areas (as per IFA and CCPs)*" will not impact the "*Traditional Culture*" of the Inuvialuit, in general, and in particular, "*Traditional Culture*" as it relates to the ability of the Inuvialuit to harvest.

Request

1. Please explain and justify how adverse effects on "*Land and Resource Use by the Inuvialuit*" and "*Land Designation Areas (as per IFA and CCPs)*" will not (or could not be expected to) result in adverse effects on the "*Traditional Culture*" of the Inuvialuit in general, and in particular as it relates to the ability of the Inuvialuit to harvest.

2.5 Cumulative Effects

IR Number: 48

To Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects assessment (EIS Section 5, pages 626-645)

Preamble

As indicated by the Developer, the cumulative effects assessment focuses only on adverse effects of the Development remaining after the application of mitigation measures; however, it was not explained by the Developer that this focused approach is based on their impact assessment predictions which have not been validated or tested. It is not clear how the relative success of the mitigation measures will be evaluated or tested with respect to cumulative effects as no specific details are provided (see Table 5.4.1-1). The Developer states that no additive or synergistic relationships between the Development and other existing or proposed developments were found to result in a significant cumulative effect on VECs or VSCs.

Although the Developer included brief descriptions of each of these past, existing and potential future projects and activities, and to what degree they may or may not contribute to a possible cumulative effect in relation to the proposed construction and operation of the Inuvik to Tuktoyaktuk Highway, the cumulative effects assessment is very much qualitative in nature. It does not appear to quantitatively assess two of the biggest concerns associated with the proposed Highway:

- future gas exploration and production in the region which may be induced by the construction of the Highway;
- increased access by people and the potential induced effects from additional hunting, fishing, camping and other similar pursuits.

The Developer is relying on the mitigation measures ('Effects Management') as presented in Table 5.4.1-1 to minimize or eliminate cumulative effects. Yet, there do not appear to be any strategies in place to evaluate the relative success of the effects management plans, mitigation measures, or assumptions regarding EIS predictions. The Developer has not presented any plans for evaluating or testing the effectiveness of the proposed mitigation measures and has not provided any definitions of what 'success' might entail in the context of cumulative effects management.

Request

1. Please describe how the relative success of the proposed mitigation of Development effects will be evaluated or tested in the context of cumulative effects.
2. Provide explain and justify the rationale for the claim that none of the past, present or future developments that were identified will interact with the proposed Development with respect to cumulative effects.
3. Explain the process behind the evaluation of synergistic or additive effects in the context of the proposed Development and cumulative effects.

IR Number: 49

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects assessment - spatial boundaries (EIS Section 5.1, page 627)

Preamble

The Developer indicates that for purposes of the cumulative effects assessment, the spatial boundaries include the portion of the Mackenzie Delta and the Tuktoyaktuk Peninsula in the general vicinity of the proposed Inuvik to Tuktoyaktuk Highway corridor, extending between Inuvik and Tuktoyaktuk, including alternate alignments considered. In section 5.1 of the EIS, the Developer has also included a description of the RSA for the Development as being the area within 15 km of the Highway (30 km total width) and the LSA for the Development as being the area within 0.5 km of the Highway (1 km total width) but has not indicated how these areas were used in the cumulative effects assessment. As such, it is not clear what the specific spatial boundaries were for the cumulative effects assessment.

Request

1. Please describe and explain the spatial boundaries of the cumulative effects assessment.
2. Please explain and justify the rationale for selecting those spatial boundaries.

IR Number: 50

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects assessment - temporal boundaries (EIS Section 5.2, page 627)

Preamble
The Developer indicates that for purposes of the cumulative effects assessment, the temporal boundaries included the next 4 to 10 years, during which time construction of the proposed Highway is anticipated to be completed and the Highway will have been in operation for up to 6 years. However, the rationale for selecting these temporal boundaries is not apparent. The Highway, if approved, would improve and increase access to a relatively large area for industrial and non-industrial uses over the expected lifespan of the Highway of at least 100 years.

Request

1. Please explain and justify the criteria used in the selection of the temporal boundaries for the cumulative effects assessment in light of increased access and expected Highway lifespan.

IR Number: 51

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects assessment - induced effects and increased access (EIS Section 5.3.1.2, page 631)

Preamble

The Developer acknowledges that it is anticipates the completed Highway will make it easier for people to access the land for their various traditional, recreational and cultural pursuits. The Developer points out that to ensure that the environment of the area remains protected, it will be important for the users of the Highway to abide by any "management restrictions" that may need to be developed for the Highway by the resource management agencies and co-management bodies in consultation with the Hunters and Trappers Committees (HTCs) and other interested stakeholders. The Developer has not defined what those anticipated "management restrictions" might be in the EIS. It is not clear how these potential induced environmental impacts through increased access (i.e., increased harvesting of wildlife, potential damage to vegetation, increased random camping, etc.) were quantitatively factored into the cumulative effects assessment.

Request

1. Please describe and explain the anticipated "management restrictions" that may need to be developed for the Highway.
2. Please indicate when "management restrictions" will be developed, if they will be in place prior to Highway completion and who will be responsible for management enforcement.
3. Please explain and justify how "management restrictions" will be evaluated in terms of their relative success at minimizing or eliminating environmental impacts.

IR Number: 52

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects management – quantifiable parameters (EIS Section 5.4.1 page 643 and Table 5.4.1-1, page 644)

Preamble
In Section 4.2 and 4.3 of the EIS, the Developer states the following: *"The significance determination includes a ranking as Class 1, 2 or 3. These classes are typically based on thresholds but because the VECs/VSCs don't include readily measurable or quantifiable parameters, the Classes are used as a general guideline to rank effects."* Table 5.4.1-1 describes the different Classes of effects, as taken from Kavik-Axys 2002.

It is difficult to understand how the VECs/VSCs selected cannot be measured or quantified. The VECs/VSCs identified as having residual effects (vegetation, wildlife and land use) can be and have been measured in a number of ways for a wide-variety of parameters. It is understood that the EIRB guidance document for cumulative effects assessment provides the following guidance on estimating thresholds where they are not readily available from standards, regulations, or directives:

- During consultations with HTCs and community residents, discuss how CCPs and the community's needs and desires can contribute to an evaluation of significance.
- In the absence of established thresholds or standards, use standards and thresholds from other jurisdictions, with the proviso that geographic, ecological and social differences are taken into account.
- Use best professional judgement, including peer review and consensus.
- Keep up-to-date and informed of ongoing work by industry, government and nongovernment organizations regarding resource management and cumulative effects.

The Developer also states that "*mitigation applied at a local scale is often sufficient to address effects at a regional scale as well"*, but provides no concrete examples to substantiate this claim in the context of the proposed Development. Contrary to this assertion, effects at different scales are not necessarily linked. For example, a local scale effect may be that caribou avoid a disturbance within a few hundred meters or kilometres. This avoidance, however, may or may not be measurable in terms of regional caribou populations. Alternatively, the mitigation measures in the LSA may reduce impacts from avoidance or mortality but will unlikely remove all impacts; that is, some residual impacts will remain. These residual impacts may be deemed small on a local scale (n the LSA) but many such small impacts in the region may add up to significant cumulative effects in the RSA. This is the very foundation of cumulative effects assessments.

Request

1. Please explain and justify why the VECs/VSCs of vegetation, wildlife and land use do not include "...*readily measurable or quantifiable parameters*..." for the purposes of the proposed development.
2. Please explain how the EIRB guidance document was utilized with respect to the approach taken for the cumulative effects assessment for thresholds.

3. Please identify and discuss examples of environmental mitigation strategies that have been implemented at a local scale in the Northwest Territories that can be identified as being successful in addressing effects at a regional scale.
4. Please explain how the relative effectiveness (or 'success') of these mitigation strategies was measured.

IR Number: 53

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects management – Regional Participation (EIS Section 5.4.1 page 643 and Table 5.4.1-1, page 644)

Preamble

With respect to regional cumulative effects management, the Developer indicates that they will *"Participate in ISR cumulative effects initiatives"* but does not elaborate how their participation in regional initiatives will assist in the management of cumulative effects.

Request

1. Please explain how the Developer's participation in regional initiatives will assist in the management of cumulative effects for the development.
2. Please provide examples of tangible results for other developments from such regional initiatives in the ISR and/or the Northwest Territories.

IR Number: 54

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Cumulative effects assessment - land use (EIS Section 5.4.1 page 643 and Table 5.4.1-1, page 644)

Preamble

Although 'land use' has been identified by the Developer as a VC that will exhibit residual effects as a result of the Development, there is no apparent estimate of changes in land use or rates of change over time in the LSA or RSA. Table 5.4.1-1 briefly describes potential impacts to land use and associated mitigation during Development construction, not post-construction.

Request

1. Please provide an estimate of land use change (i.e., the amount of disturbance with respective to zones of influence) as a result of the construction and operation of the development (i.e., utilizing aerial photographs, satellite imagery, or government data sources for resource extraction). Please indicate whether this change is in the development RSA and/or LSA.
2. Please explain and justify the approach taken and describe and explain the results with respect to historical, current and future rates of change in land use.
3. Please explain and justify post-construction land use mitigation measures and examples of where such mitigation has been determined to be successful.

2.6 Mitigation and Remediation

IR Number: 55

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Human Environment Assessment of Effects and Mitigation (EIS, Sec. 4,3, p.568-609**;** EIS, Sec. 6, Table 6-1, p.648-650**;** Addendum to the EIS, p.58-62**;** Developer Response to 2b and 2c, p. 80-131)

Preamble

Mitigation measures which the Developer has committed to implement and will require its Contractor(s) to implement are contained in the EIS (Sec. 4.3; Table 6-1), the Addendum to the EIS (in particular, p.58-62), and in the Developer Response to 2b and 2c, (p.80-131). The following is noted:

1. Some of the mitigation measures are repeated between the separate documents, but there is no compilation of all of the mitigation measures to which the Developer has committed and will require its Contractors to commit to.
2. In the Developer Response to 2b and 2c, mitigation measures contained in the text are often not repeated in the summary tables of mitigation.
3. Parties other than the DOT are identified as responsible for the mitigation of some effects, but specific mitigation measures are not suggested or recommended to these parties.

   For example, the Addendum to the EIS (p.40-41) provides further description of the Developer's assessment approach and efforts, and refers the reader to Sec. 4.3 of the EIS, which "…*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 the 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 effects and mitigation measures. It is anticipated that these agencies and departments will provide additional information to the EIRB in the Technical Phase*" (p.41). The Addendum to the EIS (p.58) further states 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*…", and provides a list of mitigation measures that the Developer and its Contractors will be required to implement (p.58-62).

A complete listing of all socio-economic commitments to which the Developer has committed will provide a basis for understanding how the Developer intends to mitigate effects, as well as provide a reference for later discussions of management and monitoring of effects. Examples of this include (1) the "Mackenzie Gas Project Response to Joint Review Panel Information Request Round 5, Question 33" in which the proponent provided a complete and up-to-date commitments table that contained the commitments made in all previous submissions, and (2) the "Commitment Register" for the Fortune Minerals Limited Saskatchewan Metals Processing Plant (EIS, June 2-11, Sec. 15.0, p.138).

Request

1. Please provide a complete list of all general and specific mitigation measures and commitments that will be implemented by the Developer and its Contractors. For each mitigation measure and commitment, please provide the following:
    a. References to where the commitment appears in the EIS, the Addendum, and the Developer Response to 2b and 2c;
    b. The effect(s) that the mitigation measures and commitments are intended to address; and
    c. The VSCs and other socio-economic components to which they pertain.
2. As part of (1), please list all other predicted socio-economic effects for which the Developer has not proposed any mitigation measures. Indicate in each case which other parties have the mandate to monitor and manage these effects.

IR Number: 56

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Water quality – validating mitigation success (EIS, Section 4.2.4, p. 487)

Preamble
The Developer states that following the application of suitable mitigation, Highway construction and operation is not expected to result in adverse residual effects to water quality or quantity. The Developer does not appear to have provided any methods or plans for testing or validating this claim; presumably, water quality testing will occur during the construction and operations phases of the development, with the results being compared to baseline conditions so as to test the EIS predictions.

Request

1. Please explain and justify how the relative success of the proposed water quality mitigation measures will be evaluated or tested.

IR Number: 57

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Potential negative effects from culvert installation (EIS, Section 4.2.4.1, p. 490)

Preamble
The Developer states that routine monitoring and inspections at watercourse crossings will be carried out to confirm the proper performance of each culvert. However, the management process and responsibility is not clear.

Request

1. Please explain and justify the expected management process and responsibility associated with ensuring that culverts are performing as needed in the context of the proposed Development.

IR Number: 58

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Borrow site reclamation (EIS, Section 4.2.6.6, p. 516)

Preamble

The Developer states that even with the application of reclamation measures, areas used for borrow material will not be completely restored to their previous state due in part to the alteration of local surface topography resulting from excavation. Re-vegetation efforts, combined with 'slow' natural re-vegetation processes, will lead to the 'slow' re-establishment of vegetation characteristic of naturally granular upland areas. Temporal scenarios associated with borrow site reclamation and examples of where borrow sites have been 'successfully' reclaimed are not apparent in the EIS.

Request

1. Please provide examples of borrow site reclamation and examples of borrow site reclamation success in the Northwest Territories.
2. Please describe and justify the criteria used to determine borrow site reclamation success.

IR Number: 59

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Roadway culverts and mitigation of known issues EIS Section 5.3.1.2 Page 631)

Preamble
The Developer states that most of the streams crossed by the Tuktoyaktuk to Source 177 Access Road are ephemeral but for potentially fish-bearing streams, the stream crossings were constructed in conformance with Department of Fisheries and Oceans (DFO) Operational Procedures designed to protect fish habitat. Areas with surface runoff were addressed with the installation of standard diameter (800 mm to 2,000 mm) roadway culverts. Follow-up monitoring during the spring/summer of 2009 determined that some areas of ponding occurred and plans were implemented to mitigate these minor issues. These 'issues' are of interest in the context of this Review.

Request

1. Please provide additional, detailed information regarding the pooling/ponding that occurred as noted during the follow-up monitoring during the spring/summer of 2009.
2. Please explain why the pooling/ponding was regarded as an issue in the context of protecting fish habitat.
3. Please explain what actions and plans were implemented to mitigate these problems.
4. Please explain and justify how similar issues will be minimized or eliminated for the proposed development?

IR Number: 60

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Third Party Responsibility for Monitoring and Mitigation (Addendum August 2010 pages 42 to 46 Table 4)

Preamble
In response to EIRB deficiency item #13 the Developer provided a draft table setting out current proposals for environmental and socio-economic effects monitoring programs. Table 4 identifies a number of third parties as the "responsible party" for a variety of project effects monitoring programs. They range from the ILA to Environmental Monitors, to HTCs and Co-Management agencies. Also included are federal government departments such as DFO, AANDC and the Prince of Wales Heritage Center.

The Developer's Response on page 42 of the Addendum sets out that: "The majority of regional and socio-economic effects monitoring efforts will be conducted by other government agencies and organizations according to their mandate". The response goes further and states "The Developer has no plans to monitor the possible socio-economic effects of the project, as these are within the mandate of territorial, Inuvialuit and federal responsibilities and programs."

These assertions are inconsistent with the "polluter pays" principle and widely based practice to require developers to monitor the effects which are the result of their projects. The Developer's answer assumes that other agencies not only should take responsibility for project effects but should pay for monitoring the effects of the Developer's project.

Request

1. Please provide examples from other major development projects in the north where responsibility for effects monitoring has been accepted by third parties (other than the developer). Provide a description of such projects, the monitoring programs undertaken by third parties, and provide documentation to explain the agreements or arrangements between the proponent and the third parties to undertake these monitoring programs.

2. Provide the results of any specific discussions between the Developer and third parties listed in Table 4 about effects monitoring programs. Provide any documentation available which indicates that these third parties have accepted responsibility for monitoring the effects of the project.

3. Where third parties have agreed to monitor the effects of the project provide specifics of the proposed relationship between the third party monitor and the Developer. Describe how and when the monitoring will take place and which party will be responsible for follow up action. If a written agreement has been reached with any of the third parties listed in Table 4 file it with the Board. If no agreements have been reached please advise the Board accordingly and describe any plans to negotiate such agreements.

2.7 Follow-up and Monitoring

IR Number: 61

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Environmental Management Plans (EMP) and Monitoring (EIS Sec. 7.0)

Preamble

The Developer relies a great deal on existing Environmental Management Plans and guidelines, as well as its own experience in listing mitigation measures: "…*environmental management plans will be developed for several Project components. The EMPs will clearly define compliance monitoring requirements, responsibilities, requirements for training, and reporting during construction*." (EIS Sec. 7.0, p.651). Examples of EMPs are presented in Appendix E. While these EMPs list procedures that help to mitigate the potential effects, they do not show the monitoring of the effectiveness of these mitigation procedures. Evidence for the success of EMPs in mitigating potential effects is required.

Request

1. Please show how monitoring was applied to measure the effectiveness of mitigation required under other EMPs of similar developments in tundra environments.
2. Please show how these effects were mitigated if monitoring indicated that there were unexpected effects.
3. For each of the two requests above (i.e. how was the effect measured and how was adaptive management applied), please discuss at least one example for each of the items listed in Table 7.3-1:
    a. Snow, Permafrost and Ground Ice
    b. Water Quantity
    c. Water and Sediment
    d. Fish Habitat, Population and Harvest
    e. Fish Quality
    f. Moose
    g. Caribou
    h. Terrestrial Mammals
    i. Avian Wildlife
    j. Marine Mammals
    k. Vegetation
    l. Climate
    m. Air Quality

IR Number: 62

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Adaptive Management Planning (EIS Commitments Table – Monitoring page xci, Table F of EIS, page 43 and Table 4)

Preamble
The EIS Commitments Table and the Addendum page 43, in answer to EIRB Deficiency item #13 indicate that "contractors will be required to employ an adaptive an adaptive management approach". Table 4 sets out VCs, effects, monitoring programs, indicators, measurement parameters, management goals and the responsible party. Page 43 of the Addendum refers to an "adaptive management program".

Request

1. Please indicate where in the evidence filed to date the Developer sets out the details of the Adaptive Management Program mentioned on page 43 of the Addendum.

2. How does this program and the monitoring and other commitments made by the Developer to date relate to adaptive management planning?

3. Please indicate the Developer's expectations for the use of the effects monitoring data. How will the information resulting be used to validate impact predictions? What thresholds are appropriate as a basis for an adaptive response by the Developer?

4. Please provide an outline of an Adaptive Management Plan, in sufficient detail to satisfy the EIRB that the results of the effects monitoring programs set out in Table 4 will be utilized for environmental protection, the improvement of mitigation actions and for compliance and enforcement by regulators.

IR Number: 63

To: The Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Monitoring (EIS Sec. 7.0, p. 651)

Preamble
Monitoring plans will need to be ready for contractors because the Developer states that contractors "*will be required to comply with the EMP*" (EIS Sec. 7.0, p. 651). This implies that the EMPs and the monitoring programs will need to be fully developed before the contractors can start their work. Moreover, the EMPs must clearly indicate what the adaptive management action might be if the mitigation measures listed in the EMP are not effective.

Request

1. Please provide the schedule of the regulatory and development execution process showing a clear commitment for the development of EMPs and the monitoring programs contained therein.
2. Discuss the thresholds which will be used to indicate when proposed mitigation measures will be determined to have failed and when adaptive management actions will need to be implemented.

IR Number: 64

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Example EMPs - Meadowbank Gold Project: transportation Management Plan, All Weather Access Road (Developer Response to 2b and 2c, Cover Letter attachments)

Preamble

The Developer submitted the Meadowbank Gold project EMP and Monitoring Plan to demonstrate to the EIRB that other road projects in the north rely on their management and monitoring plans. These plans show examples of what can be done in follow-up programs in road projects in the north. The plans, however, do not appear to provide any information on the lessons learned. This is because the plans show the well-intended mitigation that was planned, but they do not show whether or not the mitigation was successful. Having a plan in itself is not sufficient demonstration that the mitigation within the plan actually achieved the intended reduction of adverse impacts.

Request

1. Please explain if these or similar projects in the north show whether the mitigation measures under the Management and Monitoring Plans have been effective at keeping the impacts at or below predicted levels.

IR Number: 65

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Monitoring - Regional and Local Economies (Developer Response to 2b and 2c, p. 83-86)

Preamble

Section 9.1.2 (Developer Response to 2b and 2c, p. 83-84) lists and describes residual effects of the Development on the local and regional economies, and includes tourism. Section 9.1.4 (Developer Response to 2b and 2c, p. 85-86) states that "*Contribution to GDP* [Gross Domestic Product] *and Direct Taxes is related to aspects of the Tourism, Commercial and Public Recreational Use Valued Component*" and includes Table 4 of the previously submitted Addendum, which lists the indicators and measurement parameters for monitoring Tourism, Commercial and Public Recreational Use. There are, however, no corollary tables to list the indicators and measurement parameters to monitor the other residual effects described in Section 9.1.2. Section 9.1.4 (Developer Response to 2b and 2c, p. 85-86) also provides a list of agencies and organizations and their responsibilities related to "*…administering related legislation, providing funds or public services, and/or conducting monitoring."*

Request

1. For the other residual effects described in Section 9.1.2, please provide the indicators and measurement parameters that will be used to monitor the accuracy of the impact predictions and the effectiveness of the mitigation measures.
2. If the indicators and measurement parameters for the other residual effects described in Section 9.1.2 are listed elsewhere in the application, please provide references to them.
3. Please indicate which of the agencies and organizations referred to in Section 9.1.4 are responsible for monitoring the effects described.
4. Please explain how the various agencies and organizations will monitor the accuracy of the impact predictions and the effectiveness of mitigation. Include, if possible, the indicators and parameters that will be used.

IR Number: 66

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Monitoring and Valued Socio-economic Components (EIS Sec. 4.1.2, p.462**;** EIS Sec. 4.3, p.568-569**;** Addendum to the EIS, Table 4, p.45-46; Developer Response to 2b and 2c, p.80-131)

Preamble

Table 4.1.2-1 (EIS p.462) lists the Valued Social Components (VSCs) for the Human Environment. Table 4.3-1 presents a summary of the predicted effects for these VSCs, while Table 4.3-2 (EIS p.569) presents a summary of the predicted socio-economic effects for "other socio-economic components" assessed within the Human Environment Section.

Table 4 of the Addendum, titled "*Proposed Biophysical and Socio-economic Effects Monitoring Programs*" refers only to monitoring for the VSCs as they are listed in Table 4.3-1of the EIS, and does not describe monitoring for the "other socio-economic components".

The Developer response to 2b and 2c (p.80-131) describes the Developer's commitments to monitor and report on some specific effects (i.e. employment and training). It also identifies other parties that routinely undertake monitoring activities, but does not explicitly state which development-specific effects these parties will monitor, how effects will be monitored (i.e. using which indicators), and how the results of monitoring will be used to adapt mitigation, as necessary.

Request

1. Please indicate whether any monitoring programs are proposed for the other "*Socioeconomic Components*" (as listed in Table 4.3-2 of the EIS), and if so which agency is taking responsibility.
2. For each of the predicted effects, please indicate which party (or parties) are responsible for monitoring, and explain how the effects will be monitored (i.e. using which indicators, and how the results of monitoring will be used in adaptive management.

IR Number: 67

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Accidents and Malfunctions (EIS, Section 4.4)

Preamble
The Developer has committed to providing a number of plans such as a spill contingency plan, a waste management plan, and Health, Safety and Environmental (HSE) policies. The Developer notes that Environmental Monitors will ensure that contractors abide by these plans.

It is unclear how, and when these plans will be finalized and who the authorities might be to approve these plans. Clarity on the process of developing these plans is required, particularly in light of a tight construction schedule and the need to have these plans in place before construction starts.

Request

1. Please list in tabular format the plans that will be developed to deal with Accidents and Malfunctions.
2. Please describe the milestones and deadlines for the development of the plans, and describe how and by whom the plans will be approved before construction starts.
3. Please describe the process of ensuring compliance with any given plan.
4. Please indicate how non-compliance will be dealt with; this description should focus on the reporting structure, specifically noting the responsible authority, and the actions that could follow from the reporting of non-compliance.
5. Provide a schedule for submission of the final, development specific plans.

IR Number: 68

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Effects of the Environment on the Project (EIS, Section 4.5)

Preamble
The Developer recognizes the challenges surrounding climate change: "*The design parameters and construction techniques take into account consideration of these risks and provide mitigative approaches in the Highway design.*" (p.623)

However, no parameters of climate change are provided. Climate change may affect the construction, operation and maintenance of the highway. It may further increase the risk of spills during the ice-free period if climate change causes the extension of the ice-free period. Landslides are also a related problem. Finally, both climate change and landslides may cause an accelerated degradation of the road potentially resulting in safety concerns. Moreover, degraded roads would also present an increased risk of accidents in diesel fuel transportation.

Request

1. Please provide the parameters of climate change over the life of the development, showing the expected changes in temperature, precipitation, and extension of the ice-free period.
2. Pease explain how these parameters may relate to the risks of degraded road conditions, safety concerns, and potential spills.

2.8 Worst Case Scenario

IR Number: 69

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Worst Case Scenario (EIS, Section 4.4.5 pages 614 to 622)

Preamble
The Inuvialuit Final Agreement (IFA) in paragraph 13(11)(b) requires that developers provide evidence to enable an estimate of "the potential liability of the developer, determined on a worst case scenario". This is *in addition* to evidence about both actual and future wildlife harvest loss which may result from a worst case scenario. Inuvialuit have a right to compensation for both actual and future harvest loss based on section 13(15) of the IFA. Further, the IFA specifies that where there is more than one developer they are jointly and severally liable. The IFA also sets out that future harvest loss includes damages to habitat and disruption of future harvesting activities.

The EIS makes no attempt to estimate total clean up costs of the proposed worst case scenario. The estimate of liability is based only on losses (or replacement value) of fish and some fishing gear for one season and does not address impacts on fish habitat or the effects of a spill on future Inuvialuit harvesting in the affected area or future harvest losses if Inuvialuit harvesters avoid the affected area in the future.

Request

1. Have the Developers negotiated or discussed the negotiation of a Wildlife Compensation Agreement with the Inuvialuit Game Council? If such an agreement exists please file a copy with the Board.

2. Please provide an estimate, complete with supporting analysis, of the total cost of cleaning up a full "B" train load of diesel fuel spilled in the worst case situation described in the EIS. Include post clean up monitoring costs in this estimate.

3. Please evaluate the impact of the worst case scenario on the fish habitat and populations in the streams, water courses and Husky Lakes. Provide an estimate of the cost of remediating these affected habitats.

4. Review the estimate of actual harvest loss and equipment in light of the answers to questions (2) and (3). Adjust your estimate accordingly, or if no change is warranted, explain and justify why.

5. Based on traditional knowledge and community consultation evidence developed during the preparation of the EIS and any other relevant sources of information, please advise the Board about the likelihood that Inuvialuit harvesters would avoid the area affected by the worst case scenario spill. How long might these harvesters be displaced? Estimate the additional cost to Inuvialuit harvesters of being displaced in terms of both travel costs to alternative fishing areas and the likelihood that harvests will not be as successful in alternative areas.

6. Estimate future harvest loss to traditional users of the Husky Lakes area based on your answers to (3) and (5) and any other relevant information.

7. Provide evidence of the financial responsibility (capacity) of the Government of the Northwest Territories, Town of Inuvik and Hamlet of Tuktoyaktuk to address the combined costs of the worst case scenario and actual and future harvest losses. Separate evidence must be provided for each of the Developers.

IR Number: 70

To: Developer (GNWT, Hamlet of Tuktoyaktuk, and Town of Inuvik)

Subject: Fish Health – Worst Case Scenario (EIS, Section 4.4.5)

Preamble
The Developer states: "*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. Section 13.(11)(b) of the IFA requires 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." The proposed Highway from Inuvik to Tuktoyaktuk is subject to these terms*."(p.614)

Given that the objective is to prevent damage to wildlife and its habitat, it is unclear what mitigation measures and road design elements are proposed to prevent such damage. The Developer argues in Section 4.4.5 that a year-round supply of diesel fuel would be more cost-effective for Tuktoyotuk than the current situation and that during the winter conditions spills can be cleaned up easily and effectively. Additionally, the potential risks from petroleum hydrocarbon spills, including diesel, during the ice-free period appear to be dismissed because *"small diesel spills (2,000 L to 20,000 L) will typically evaporate and disperse within a day or less, even in cold water; therefore, seldom is there any fuel on the surface to recover (NOAA 2006)"* and because "*Small spills (<20,000 L) in open water are so rapidly diluted that fish kills have never been reported, except when small spills occur in confined, shallow water the number of marine birds typically affected is small due to the short amount of time the diesel oil is on the water surface*." (p.616).

However, the Developer has provided no concrete evidence or data to support these statements. No surveys and monitoring programs on fish health, embryonic development, or bird and mammal mortality are reported to support the Developer's arguments. There are examples of incidents that have occurred over the past two years in other jurisdictions that show diesel spills along highways have occurred, often in volumes much smaller than those stated by the Developer, including one near High River, Alberta where a Transportation Company pleaded guilty to violating subsection 36(3) of the *Fisheries Act* and was fined for spilling just 550 liters. Given the evidence regarding lack of due diligence and failure to prevent spills, and the recurring violations noted by Environmental Canada under the *Fisheries Act, Migratory Birds Convention Act,* 1994, and any applicable territorial or provincial legislation, diesel and other contaminant spills are a very serious matter and should be adequately and pro-actively addressed.

Although the Developer calculates the amount for the potential liability of a potential spill, the liability calculation only serves to provide a yardstick by which, presumably, compensation to traditional land users would be established after a spill would occur. No specific measures to prevent spills are proposed other than speed limits.

Request

1. Please provide examples of the results of post-spill monitoring programs and surveys on fish health (including sublethal effects), fish embryonic development, and bird and mammal mortality that evaluate the magnitude of effects resulting from spills from other jurisdictions.
2. Please provide specific mitigation measures that are part of the road design and part of the contingency plans which would prevent spills from entering water bodies during the ice-free period for this proposed development.