



Mackenzie Valley
Environmental Impact
Review Board

Terms of Reference
for the
**Taltson Hydroelectric Expansion
Project**
Developer's Assessment Report

Mackenzie Valley Environmental Impact Review Board

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1 Introduction

1.1 Purpose

The Mackenzie Valley Environmental Impact Review Board (MVEIRB or the “Review Board”) is conducting an environmental assessment of Dezé Energy Corporation’s proposed Taltson Hydroelectric Expansion Project (the “Expansion Project”). The environmental assessment will be carried out pursuant to Section 5 of the *Mackenzie Valley Resource Management Act* (MVRMA).

The Review Board has released this *Terms of Reference* document to provide instructions to Dezé Energy Corporation (the “developer”) for preparing a Developer’s Assessment Report (DAR) of its Expansion Project. The *Terms of Reference* establishes both the scope of the development, as well as that of the assessment. It provides the developer with instructions on the assessment methods to be used, the type of information that is required, and how the information should be presented.

The developer is required to produce a DAR based on reasonable interpretation of these instructions. If necessary, the Review Board and the parties will address any shortcomings of the DAR through information requests, technical sessions and public hearings. At any time during the environmental assessment, the developer is encouraged to contact the Review Board for clarification in writing.

1.2 Preliminary Screening and Issue Scoping

Dezé Energy Corporation submitted a completed application to the Mackenzie Valley Land and Water Board for a type A Land Use Permit (MV2007I0033) and a type A Water License (MV2007L4-0029) on June 5, 2007. The Mackenzie Valley Land and Water Board notified the Review Board and other interested parties that it had commenced its preliminary screening of the development on June 20, 2007. On October 5, 2007, the Mackenzie Valley Land and Water Board referred the Expansion Project to environmental assessment on the basis that the proposed development might have significant adverse impacts on the environment and might be a cause of public concern.

On October 17, 2007, the Review Board notified the developer that it had initiated an environmental assessment. To assist it in developing Terms of Reference, the Review Board held community scoping sessions in Fort Smith and Fort Resolution on November 28 and November 29, 2007, respectively. Technical and community scoping sessions were subsequently held in Yellowknife on December 7, 2007. A community scoping session was also held in Lutsel K’e on March 7, 2008.

1.3 Approach

The Review Board has made an effort to not only to identify all the issues pertinent to the Expansion Project, but also has attempted to prioritize the issues to focus the developer’s efforts on what the Review Board views as being the most important. The results of the scoping sessions, as documented by MVEIRB staff, suggest that particular aspects of the

proposed development and their potential adverse impacts may require higher levels of examination than others.

Every issue identified in this *Terms of Reference* requires sufficient analysis to demonstrate whether it is likely to be the cause of significant adverse impacts. However, some issues have been identified by the Review Board as those that require particular attention during the environmental assessment. These special issues are categorized as either *Key Lines of Inquiry* or *Subjects of Note*.

Key Lines of Inquiry are topics of the greatest concern that the Review Board deems to require the most attention during the environmental assessment and the most rigorous analysis and detail in the DAR. There are three Key Lines of Inquiry, which are presented in section 4.

Subjects of Note do not have the same priority as Key Lines of Inquiry, but are nonetheless issues that require serious consideration and a substantive analysis. There are twelve Subjects of Note that are presented in section 5.

The developer's responses for Key Lines of Inquiry and Subjects of Note must be more than just summaries of the issue-specific responses to the items identified in sections 4 and 5. Responses to Key Lines of Inquiry and Subjects of Note must be comprehensive stand-alone analyses which require only minimal cross-referencing with other parts of the DAR. The developer's level of effort in providing an analysis of each issue must be appropriate for the category that the issue falls within. This means that a substantive effort should be directed at addressing Subjects of Note, and the highest level of effort should be directed towards the Key Lines of Inquiry.

In addition to Key Lines of Inquiry and Subjects of Note, this document describes further information requirements regarding sustainability and cumulative effects, as well as on certain remaining issues not necessarily captured in sections 4 and 5. Detailed requirements for these are provided in sections 6 and 7 respectively.

1.4 Definitions

The definitions in sections 3 and 111 of the MVRMA apply. In addition, definitions in the following guidelines and reference bulletins issued by the Review Board apply:

- *Environmental Impact Assessment Guidelines*, Mackenzie Valley Environmental Impact Review Board, Yellowknife, NT. March 2004
- *Guidelines for Incorporating Traditional Knowledge in Environmental Impact Assessment*, Mackenzie Valley Environmental Impact Review Board, Yellowknife, NT. July 2005.
- *Socio-Economic Impact Assessment Guidelines*, Mackenzie Valley Environmental Impact Review Board, Yellowknife. March 2006.
- *Reference Bulletin: Operational Interpretation of Key Terminology in Part 5 of the Mackenzie Valley Resource Management Act*. Mackenzie Valley Environmental Impact Review Board, Yellowknife. April 2006.

Throughout this environmental assessment, the term “community” refers to any potentially affected settlement, town, village, or city, as well as any First Nation or Métis group unless otherwise specified.

1.5 Legal Requirements

This environmental assessment is subject to the requirements of Part 5 of the MVRMA and is also subject to the Review Board’s *Rules of Procedure*. The EA process is further described in the Review Board’s *Environmental Impact Assessment Guidelines*. Copies of these documents can be obtained by contacting the Review Board or at www.mveirb.nt.ca.

1.6 Document Overview

The remainder of this document is organized as follows:

- Section 2** defines the scope of the development under review, as well as the scope of the environmental assessment.
- Section 3** provides the Review Board’s general information requirements. It describes the information required for the proposed development and environment in which it is to be situated. This section also discusses various other aspects of assessment, including how the developer must describe impact predictions, significance criteria, use of traditional knowledge and monitoring efforts.
- Section 4** describes the Key Lines of Inquiry. It provides a description of each issue, an account of why it is particularly relevant and offers an account of the Review Board’s expectations for addressing the issue in the DAR.
- Section 5** describes the Subjects of Note. Similarly to the previous section, it provides a description of each issue, an account of why it is particularly relevant, and an account of the Review Board’s expectations for addressing the issue in the DAR.
- Section 6** describes the Review Board’s requirements for the analysis of the overall sustainability of the development, as well as the cumulative effects analysis.
- Section 7** provides information requirements for all remaining issues, which are organized by subject and listed in tables.
- Section 8** provides guidance on the deliverables required from the developer.

2 Scope

2.1 Scope of Development

The scope of the development under review includes the principal development, which is the expansion of a hydroelectricity generation facility and the establishment of an electricity transmission line, as well as any activities or structures associated with the principal development, from pre-construction to closure and reclamation. The development scope is based on the *Project Description*¹ provided to the Mackenzie Valley Land and Water Board.

Table 2-1 provides a brief overview of the components considered in the scope of development.

Table 2-1: Development Overview

Phase	Components/Activities
Construction	Construction of Twin Gorges expansion facility, including canal and buildings
	Construction of Nonacho Lake control structure
	Construction of transmission line and substations
	Construction of laydown yards and temporary camps, as well as camp activities
Operations	Generation and transmission of electricity
	Maintenance of all facilities
Water Management	Discharge of water through the Twin Gorges generation facilities
	Operation of Nonacho Lake control structure
	Intermittent flow changes through South Valley Spillway and Trudel Creek
	Wastewater management during construction and operations
Transport	Reestablishment of temporary winter road from Fort Smith to Taltson Twin Gorges
	Establishment of temporary winter road from Taltson Twin Gorges to Nonacho Lake
	Use of the current Tibbitt-Contwoyto winter road and Snap Lake/ Gahcho Kue spur during construction
	Barging of transmission materials on Great Slave Lake to laydown areas
	Use of helicopter and/or fixed wing aircraft for construction and maintenance
Closure and Reclamation	Closure and reclamation of project components

¹ Dezé Energy Corporation, May 2007 (Revision 1): “Project Description In Support of the MVLWB Land and Water Applications”

2.2 Scope of Assessment

The scope of the environmental assessment is governed by the requirements of the MVRMA, the Review Board, as well as recognized best practices in environmental impact assessment. The scope of this environmental assessment includes all potential impacts on the bio-physical and the human environment from the development, by itself and in combination with other past, present and reasonably foreseeable future developments. The temporal scope of the assessment ranges from pre-construction activities to construction, operation, closure, and post closure until reclamation or restoration is achieved.

2.2.1 MVRMA requirements

The MVRMA defines an impact on the environment to mean “any effect on land, water, air, or any component of the environment, as well as on wildlife harvesting, and includes any effect on the social and cultural environment or on heritage resources” (MVRMA section 111(1)). Moreover, the MVRMA provides the EA process with guiding principles, including “*having regard to:*

- a) the protection of the environment from significant adverse impacts of proposed development;*
- b) the protection of the social, cultural and economic well-being of residents and communities in the Mackenzie Valley; and*
- c) the importance of conservation to the well-being and way of life of the aboriginal peoples of Canada [..]” (MVRMA section 115).*

Section 117(2) of MVRMA lists a number of provisions the Review Board must consider in its environmental assessment. These include:

- Impacts on the environment, including impacts of malfunctions and cumulative impacts, and their significance;
- Comments by members of the public; and
- The need for mitigative or remedial measures.

In addition to the items described in this *Terms of Reference*, the Review Board may require further additional information or clarification at any time during the assessment process.

2.2.2 Inclusion of scoping session results

In developing the *Terms of Reference*, the Review Board considered the input provided from the technical and community issue scoping sessions. The results of those sessions were evaluated by the Review Board to help it identify and prioritize both the Key Lines of Inquiry and the Subjects of Note.

2.2.3 Geographic scope of assessment

The geographic scope of study must be appropriate for the potential Valued Component being assessed. The Expansion Project is comprised of several different project components (e.g. generation facilities, transmission lines) with each component having

its own possible range of geographic influence. The geographic scope must consider potential project effects on all areas that may be impacted in some identifiable way by the Expansion Project, including upstream and downstream of Taltson Twin Gorges, the ranges of wildlife using the entire area and the areas potentially-impacted by transportation activities, including the temporary winter road from Fort Smith to Twin Gorges, and from Twin Gorges to Nonacho Lake.

The geographical scope for assessing impacts on the human environment shall include, but not necessarily be limited to communities that use areas which may be impacted by the Expansion Project, including, but not limited to communities in the North Slave and South Slave regions of the NWT.

3 General Information Requirements

This section outlines information requirements regarding the developer, consultation undertaken, the description of the proposed development and the existing environment, the methods used for predicting impacts, and the presentation of information in the DAR.

If, at any time, the developer is unsure about the requirements of this *Terms of Reference*, or the nature of the information requested, the developer should contact the Review Board office to seek written clarification.

3.1 Development and Environment Description

3.1.1 Executive summary

Provide a plain language, non-technical summary of the DAR containing the most relevant points for decision-makers and the public.

3.1.2 Conformity table²

The DAR should include a table that cross-references the items in the ToR with the relevant section(s) of the DAR.

3.1.3 Developer

Dezé Energy Corporation must provide the following information:

- a) The ownership of the proposed development and its organizational structure, including relation to parent organizations, and including the division of responsibilities between the partners to the Expansion Project;
- b) A description of any obligatory or voluntary requirements for reporting project information to the public;
- c) A summary of the environmental performance and policies (including socio-economic policies) of the developer, its partners and parent organizations;
- d) A description of the relationship between Dézé Energy Corporation and its contractors and subcontractors, including how the company will ensure that the contractors and subcontractors will be responsible for upholding relevant commitments made by Dézé Energy Corporation;
- e) A description of the environmental benefits of the proposed expansion project; and
- f) A description of the economic benefits to the people of the Northwest Territories, including aboriginal peoples.

² Also described in Section 3.2.8

3.1.4 Community engagement

Dezé Energy shall provide the following information regarding its efforts to engage with communities that may be potentially affected by the development:

- a) A description of community engagement efforts undertaken by the developer, including location, meeting times and dates, individuals and organizations consulted with, mode of communication and topics of discussion;
- b) Methods used to identify, inform and solicit input from potentially-interested parties and persons;
- c) A description of any commitments or agreements made in response to issues raised during the community engagements, and how these commitments altered the planning of the proposed development;
- d) A description of issues that remain unresolved, as well as any documentation of further efforts to help resolve them; and
- e) A discussion of the developer's community engagement plan that specifically focuses upon the holders of aboriginal and treaty rights in the project area.

3.1.5 Development description

The developer is required to provide a comprehensive development description that takes account of all proposed components of the Expansion Project. Sufficient detail must be provided for the Review Board to adequately consider the potential impacts of the development. The description should present technical renderings of all major components at a level of detail appropriate to an environmental assessment. More detail than was provided in the *Project Description* is required for some development components, including ancillary developments, such as the barging sites or laydown areas that will be constructed or improved. The descriptions must also include proposed schedules, activities and milestones related to the construction and operation of the Expansion Project.

In addition, the developer is requested to provide the following additional information:

- A. ***Economic and employment information:*** This must include expected capital costs, estimated annual operating costs for each year of estimated operation, and total expected revenues, along with the capacity usage and price per kilowatt hour assumptions underlying this estimate. The content of the information provided and level of detail will be in consideration of potential owner-client confidentiality and business development considerations. The number of person-years of work, broken down according to construction or operations stage, must be reported, as well the number of jobs broken down by skill categories.
- B. ***Rationale for the need of the development:*** The developer must provide a rationale which describes the developer's motivation for the Expansion Project and its understanding of how the proposed development meets the needs of its expected customer base, potentially affected communities, and

the NWT in general. The analysis must include a discussion of the proposed timing of this development in relation to other ongoing or proposed developments that will either enhance or reduce the need for this development, such as operating or proposed diamond mines, or the Bathurst Inlet Port and Road.

Where appropriate, video presentations, maps, aerial photographs, and other visual media should be used to facilitate understanding of the proposed development for all parties. The DAR must also include a description of all regulatory permits, licenses and other authorizations required to carry out the development.

3.1.5.1 Commitment table

The developer shall present a table of any commitments that it has made to date in the course of developing its DAR. This should also include commitments made as a result of community engagement efforts undertaken since the conclusion of the preliminary screening.

3.1.5.2 Reclamation and restoration

While the Expansion Project differs from many development projects in the NWT in that the hydroelectric generation facilities may operate indefinitely to serve existing communities, it is possible that other components of the development, particularly the transmission line intended to serve the diamond mines, will have a more limited lifespan. As such, the Review Board requires the developer to, at least at a conceptual level, describe how it intends to reclaim and restore components of the Expansion Project that are no longer required following the completion of the Expansion Project business cycle. For components that are not going to be required in the long term, such as the temporary winter road, detailed plans for the reclamation and restoration of such components are necessary. The Review Board requires the following:

- a) A description of the policies, regulations and industry standards that will be considered in the development of the developer's Abandonment and Restoration (A&R) Plan.
- b) A conceptual A&R Plan for the purpose of this environmental assessment, which shall include, but not be limited to:
 - A list of A&R components and activities;
 - The rationale for the selection of proposed activities versus alternatives that have been dismissed;
 - Conceptual details of the methods and location for materials on and off-site disposal; and
 - A cost-estimate component of proposed reclamation and restoration activities;

3.1.5.3 Waste management

Waste management in this section refers to the management of sewage, camp waste, construction materials, engine fluids, and other wastes generated during construction and

operation, rather than the management and disposal of waste rock and overburden generated through canal construction.

The DAR must provide a plan for waste management during construction and operation, including:

- a) Camp sewage;
- b) Camp refuse;
- c) Engine fluids or other hydrocarbons at lay down areas and on access routes, including handling of hydrocarbon contaminated soil that may be generated from development activities;
- d) Scrap metal, as well as discarded machinery or parts;
- e) Discarded construction material;
- f) Hazardous materials;
- g) Any other waste generated; and
- h) A discussion of any waste minimization initiatives and or commitments such as company green procurement policies and recycling.

3.1.6 Existing environment

A description of the existing environment is required in order for the Review Board and Parties to assess the potential direct, indirect and cumulative impacts of the proposed development on the environment that it is to be situated in. The level of detail provided for each physical, biological, or social valued component should correspond to the predicted level of interaction between the valued components and the Project.

Some environmental components, especially those of the physical environment, may require only regional or overview descriptions, except where a direct overlap exists between the Project footprint and the environmental component, whereas other components, such as those in the biological environment, may require considerably more information and level of detail.

The developer is required to describe the following:

3.1.6.1 Development location

- a) The physical location of the proposed development (with maps), including ecozone(s) and ecoregion(s).

3.1.6.2 Areas of special sensitivity

The Developer will identify and provide maps in the DAR of any areas of “special sensitivity” in the existing environment that merit special attention because of the presence of:

- a) SARA-listed species in the area;
- b) Unique landforms, topography, or geological foundations;

- c) Heritage resources or areas of high potential for heritage resources;
- d) Areas of significant recreational and aesthetic value; and
- e) Traditional harvesting sites, trap lines and/or trails.

3.1.6.3 Physical environment

Bedrock, subsurface and soil characteristics

- a) Bedrock characteristics;
- b) Acid rock drainage potential of exposed bedrock at project sites where blasting, excavation and removal will occur;
- c) Unconsolidated materials and terrain types, including thickness;
- d) Landforms, including bogs, fens and peat plateaus and eskers; and
- e) Soil types;

Permafrost

- a) Distribution, thickness and lateral extent on the surface; and
- b) Permafrost processes, features and stability, including a description of the active layer.

Areas of potential instability

- a) Areas of geological instability, geological hazard and seismicity; and
- b) Discussion of regional seismic activity.

Climate

- a) Prevailing climatic conditions and seasonal variations, including trends and extreme phases; and
- b) Location of recording stations for climatic data and length of record available.

Air quality

- a) General identification of the airshed(s) within which the project is located and a rationale for the airshed delineation;
- b) General Any current sources of emissions to the airshed(s), including current seasonal variations in climatic conditions that affect air quality; and
- c) Visibility³

Noise

- a) Existing sources of noise in the project area; and
- b) Present noise in terms of frequency, duration, decibel levels throughout the year.

³ The visibility of structures as it pertains the safety of nautical, land and air travel, as well as wildlife safety are the key considerations within this requirement.

Water quality and quantity

- a) Identification and characteristics of major water bodies, watercourses, major drainage areas and watersheds that may be potentially affected by the proposed development;
- b) Existing water quality for major water bodies identified as being potentially affected by the development;
- c) A discussion of the selection criteria that the developer has employed to determine if a water body is considered “major” or “significant”; and
- d) Identification of relevant federal, provincial or territorial guidelines, criteria or legislation for protection of water quality and quantity.

3.1.6.4 Biological environment

Fish and aquatic life forms

- a) Key fish-bearing water bodies and watercourses that may be affected by the proposed development;
- b) Potentially affected species and local populations, and for each describe:
 - I. Seasonal and life cycle movements;
 - II. Habitat requirements for each life stage;
 - III. Local and regional abundance, distribution, and anticipated use of habitat;
 - IV. Known existing or expected sensitive habitat areas, species or life stage/activity (e.g. spawning, hatching, feeding);
- c) Key species used for traditional harvesting activities, commercial fishing or sport fishing in potentially-affected water bodies; and
- d) Any known issues currently affecting fish and aquatic life forms in the development (e.g. contamination of food sources, changes in water level and temperature).

Birds and bird habitat

- a) Key species present, and for each describe:
 - I. Abundance, distribution, seasonal movements, and habitat requirements;
 - II. Areas of specific use at various life stages (e.g. breeding grounds, molting periods);
 - III. Any sensitive time periods or habitat;
- b) Key species used for traditional harvesting activities or sport hunting; and
- c) Any known issues currently affecting birds and bird habitat in the development area.

Caribou (barren ground and woodland)

- a) List each herd and subspecies present within the development area, and for each describe:
 - I. Current population trends, including abundance, distribution and demographic rates such as calf survival, and adult mortality;
 - II. Habitat requirements, including identifying areas of specific habitat use at different life stages (e.g. calving grounds, post calving and summer ranges);
 - III. Attributes of the seasonal habitats that relate to how caribou use them (e.g. insect relief, travel routes, forage);
 - IV. Known population pressures, both natural and human-caused;
 - V. Recognized gaps in current knowledge of caribou such as assessing impacts disturbance, harvesting, behaviour or abundance;
- b) Migratory routes, patterns and timings in relation to the proposed project activities, including typical patterns and the range of known variations;
- c) Traditional harvesting activities in relation to caribou;
- d) Traditional values in the context of respect for caribou and how people should behave toward caribou; and
- e) Any known issues currently affecting caribou in the development area.

Key Mammals (excluding caribou)

- a) Species present, and for each describe:
 - I. Abundance, distribution, seasonal movements, habitat requirements;
 - II. Areas of differing habitat use at various life stages (e.g. denning);
 - III. Any sensitive time periods or habitat;
 - IV. Any other relevant sensitivities or limiting factors, such as behaviours or territory requirements;
- b) Key species used during traditional harvesting activities; and
- c) Any known issues currently affecting wildlife (excluding caribou) in the development area.

Vegetation

- a) Vegetation types in the project area (including a map and any classification systems relevant to the area);
- b) Species present in the project area and indicate any species that are valued or rare;
- c) Relative density and height of forest cover throughout the project area; and

- d) The existing natural fire regime, including frequency and past events.

Vulnerable species⁴

- a) Any species present or potentially present in the project area that are listed under the federal *Species At Risk Act* as Special Concern, Threatened or Endangered;
- b) Any species listed by the GNWT with designations “may be at risk”, “at risk” or “sensitive” in the *General Status Rankings for Species in the NWT* within the project area;
- c) Any species present that may be affected by the project or potentially present in the project area that are under consideration by the Committee on the Status of Endangered Wildlife in Canada; and
- d) For such species present that may be potentially affected by the project, describe their habitat locations that may be impacted by the project, critical habitat needs, potential residences, population status, sensitivities and other limiting factors.

3.1.6.5 Human environment

When developing a portrait of the existing human environment, the developer must use an issues-driven approach, focusing on valued components, criteria and indicators that are both important to the potentially affected communities in question and potentially affected by the development being proposed. The description should include:

- a) Levels of industrial activity occurring in the development area, including physical infrastructure such as roads, hydro-electric structures, buildings, quarries, power lines and other industrial works.
- b) Current and likely future rates of electricity consumption from industrial users (including a list of assumptions associated with these predictions), as well as the current and likely future energy requirements of potentially-affected communities;
- c) Current and trend patterns in socio-economic conditions of potentially-affected communities within the area of interest;
- d) Historic and present land use, with the identification of traditional land use groups and areas of overlapping land use;
- e) Cultural, archaeological and heritage resources, with the identification of the cultural groups who associate with these resources; and
- f) Identification of potentially affected water bodies which are currently used for navigational purposes.

The developer is encouraged to use the Review Board’s *Socio Economic Impact Assessment Guidelines* (available at www.mveirb.nt.ca) to help prepare the socio-

⁴ The developer is recommended to reference the Environmental Assessment Best Practice Guide for Wildlife at Risk in Canada (Canadian Wildlife Service, Environment Canada, 2004).

economic impact assessment (SEIA). Appendices D and E of the *Socio-economic Impact Assessment Guidelines* identify some elements of the human environment to be considered.

3.2 Assessment Methods and Presentation

3.2.1 Impact predictions

Methods used to describe environmental conditions and to identify and measure impacts on the environment should be consistent with high standards and best practice in the relevant subject areas. Pathways of predicted impacts should be shown schematically and described in words.

In describing methodology:

- Explain how scientific, engineering, traditional, and other knowledge was used to
 - Describe the existing environment;
 - Evaluate potential impacts;
 - Reach conclusions about predicted impacts;
- Document all models and studies so that analyses are transparent, and where appropriate, reproducible;
- Identify which studies included the assistance of communities, who was involved, and how participants were selected;
- Specify data collection methods and report the uncertainty, reliability and sensitivity of the methods used to reach conclusions;
- Identify and justify any assumptions made;
- Support analyses, interpretation of results and conclusions with reference to appropriate literature;
- Specify and reference sources for any contributions based on traditional knowledge; and
- Identify all proposed mitigation measures, along with evaluations of confidence levels in the effectiveness of those measures, and describe the residual impacts.

3.2.2 Significance determination

The developer must provide its views on the significance of impacts on all Valued Components⁵, using the following criteria:

<i>Direction</i>	The main focus of the environmental assessment is to assess whether the development is likely to cause significant adverse impacts on the environment or be cause for public concern. The developer is also encouraged to report anticipated positive changes. These may be used by parties or the Review Board to evaluate the overall impact of the development.
<i>Magnitude</i>	Magnitude refers to the degree of change that may be caused, e.g. amount of water diverted. Where possible, magnitude should be reported in absolute and in relative terms.
<i>Likelihood</i>	Likelihood refers to the probability of the impact occurring.
<i>Geographical Extent</i>	Geographical extent refers to the area affected. Where an impact may affect various areas to differing degrees, separate analysis may be required. For example, downstream effects may be separated into several geographic areas of high, medium, low magnitude, rather than reporting an average impact on a large area.
<i>Duration</i>	Both the duration of individual events (e.g. waste water discharges) and the overall time frame during which the impact may occur (e.g. during construction, operation, and closure) must be considered. In addition, the length of time the predicted impact will last must be reported and considered.
<i>Frequency</i>	The frequency of impacts and events causing impacts must be considered, as well as the length of time between occurrences.
<i>Reversibility</i>	<p>The reversibility of any impacts must be considered not only in terms of whether the impact is reversible at all but also in terms of how much time will be required for the affected environmental component to recover.</p> <p>In terms of the human environment, the manageability of impacts may be considered rather than their actual reversibility. Where appropriate the evaluation must also identify the existing social resources that may be diverted due to the proposed development to facilitate maintenance of acceptable conditions.</p>
<i>Ecological Context</i>	Ecological context refers to the type of the impact as well as the nature of the affected environmental component. For example, the mortality of a hundred caribou might be considered significant, while the mortality of a thousand mosquitos might not, although criteria such as frequency, geographic extent and even magnitude may appear to indicate otherwise. Generally an impact on a highly valued component may trigger significance at relatively low magnitude, duration, and likelihood. Thresholds should be considered in this regard.

⁵ Note that analysis of the human environment may require slightly different analytical criteria than the biophysical environment. See Section 5.6 of the Review Board's *Socio-economic Impact Assessment Guidelines* for more information.

3.2.3 Uncertainty analysis

Any impact prediction or impact analysis contains an amount of uncertainty. This may be related to limitations in the understanding of natural systems or the inability to predict future events or conditions (e.g. disasters, extreme weather). The DAR must provide a reasonably accurate description of the uncertainties associated with each prediction. Similarly, when making a significance determination, the DAR must report the confidence with which this determination can be made. The uncertainty analysis must include a description of the confidence in underlying assumptions, models, data sources, etc. The uncertainty analysis must also identify parameters that should receive particular attention when developing follow-up programs.

3.2.4 Valued components

Environmental impact assessment uses valued components (also referred to as valued ecosystem components or valued socio-economic components) to focus impact predictions on important components of the bio-physical and human environment. Individual species or societal goals are commonly selected as valued components.

The Key Lines of Inquiry and Subjects of Note involve valued and highly valued components. Key Lines of Inquiry and Subjects of Note are interdisciplinary, and typically will involve more than one valued component. The developer may select additional valued components not directly identified in these Terms of Reference, but must ensure that all Key Lines of Inquiry and Subjects of Note are thoroughly reflected in the identification of related valued components. The developer is expected to provide a rationale for the valued components it has selected.

3.2.5 Traditional knowledge

The Review Board will rely on both traditional knowledge and conventional scientific knowledge while conducting the environmental assessment. In the Review Board's view, traditional knowledge holders are experts in their own right and must be treated with the same respect as scientific experts. The use of traditional knowledge must be reported in all relevant sections.

The developer is encouraged to apply the Review Board's *Guidelines for Incorporating Traditional Knowledge in Environmental Impact Assessment* wherever applicable when preparing the DAR. The methods used in the acquisition, analysis, and presentation of traditional knowledge are at the developer's discretion but must be consistent with the Review Board's TK Guidelines.

The traditional knowledge summary report must address the following specific items:

- a) Which communities and traditional knowledge holders participated in any traditional knowledge studies and how those participants were identified and agreed upon;
- b) What approach was taken in working with traditional knowledge holders and in the collection and use of traditional knowledge, and why;
- c) Verification from each community whether there are policies and cultural practices for the acceptable standards for working with traditional knowledge

- holders and handling the traditional knowledge. Where these do exist, verify how they were adhered to;
- d) Sources of traditional knowledge that have been used, including specific studies, archives, and individuals interviewed;
 - e) When traditional knowledge is collected from existing studies and reports, verification that secondary sources are relevant and appropriate;
 - f) Evidence that the traditional knowledge was collected and peer-reviewed with the Aboriginal community or traditional knowledge holders, and approved by the appropriate individuals or organizations; and
 - g) How traditional knowledge and traditional knowledge holders have influenced the developer's project design, impact assessment, and mitigation measures, as well as reclamation and closure planning.

The DAR should outline any plans for future cooperation between the developer and traditional knowledge holders, and provide any commitments or agreements concerning such efforts.

Subject to confidentiality considerations, the summary report on acquisition and analysis of traditional knowledge should include, or have regard to:

- Who currently or traditionally (individuals and communities) uses or has used the area;
- What types of uses (historical and current) are occurring;
- Known or potential heritage resources and sacred sites;
- The intensity of cultural practices such as hunting, trapping and gathering; and
- Cultural significance (including spiritual significance) of the area.

Where traditional knowledge and conventional science come to different impact predictions, the DAR must identify the different conclusions and outline how the developer proposes to deal with the disagreement (e.g., through further study or precautionary mitigation).

3.2.6 Alternatives

The examination of possible alternative means to carry out a development is a standard requirement of environmental assessments conducted by the Review Board. The developer should use the development as described in the DAR as the baseline case for predicting impacts and determining significance of alternatives.

In the case of the Expansion Project, options for the routing of the transmission line are particularly important to be considered in DAR. While Dezé Energy Corporation has indicated its preferred transmission line route east of Great Slave Lake in its *Project Description*, the Review Board requires that the DAR seriously consider and discuss alternatives to the proposed routing from both environmental and social acceptability perspective, as well as from an engineering and economic feasibility point of view.

In discussing any alternatives, the DAR must also provide an overview of how environmental conditions have influenced the project design for technically or economically feasible alternatives. The consideration of alternatives should not be necessarily limited to those the developer currently considers financially feasible. The DAR should report all alternatives the developer considered and dismissed during the early project design, and must provide reasons for dismissal. If financial reasons are used as a rationale for rejection of the alternative, the estimated cost of those alternatives should be provided. For those alternatives the developer identifies as feasible, differences in environmental issues should be presented.

The DAR must provide an economic and technical analysis of alternatives to individual development components or activities, including but not limited to:

- a) Generation plan alternatives for hydroelectric generation on the Taltson River within the existing infrastructure footprint (i.e. Nonacho Lake to Twin Gorges);
- b) Evaluation of alternative routes including social, environmental, economic and engineering factors for the following routes (others may also be considered):
 - I. Marine Cable Option across Great Slave Lake
 - II. Trans-Island Option
 - III. Trans-Island Option with marine cable placements
 - IV. Northern and Western Option (as described in Section 10.3.2 of the *Project Description*)
 - V. Routing around the West Arm of Great Slave Lake via Hay River and Yellowknife
- c) An evaluation of the social, environmental, engineering and economic factors (including dollar figures) that led the developer to select its proposed line routing in opposition to other economically or technically feasible alternative routes; and
- d) Discussion of the role that alignment options, such as tower placements and spacing will have on minimizing environmental impact.

3.2.7 Monitoring programs

The monitoring of social, economic, cultural and biophysical effects related to the development is an essential EA consideration. For each valued component considered in the DAR, the developer must provide a description of any commitments, plans and programs that are proposed to monitor possible impacts. The term “monitoring” can be applied to several different activities. The developer must clearly distinguish which of the following meanings is meant with each use of the term “monitoring” in the DAR:

1. Compliance inspection (i.e., the activities, procedures and programs undertaken to confirm the implementation of approved design standards, mitigation, conditions of approval and company commitments);
2. Environmental monitoring (i.e., monitoring to track conditions or issues during the development lifespan, and subsequent adaptation of project management); or

3. Follow-up (i.e., any programs to verify the accuracy of impact predictions and determine the effectiveness of mitigation measures). Follow-up should include effects monitoring and the determination of residual impacts (including unexpected or unpredicted impacts).

In the case of follow up programs, the *MVRMA* defines a follow up program as “*a program for evaluating*

- (a) *the soundness of an environmental assessment or environmental impact review of a proposal for a development; and*
- (b) *the effectiveness of the mitigative or remedial measures imposed as conditions of approval of the proposal.*”

The DAR must include a description of any follow up programs, contingency plans, or adaptive management programs the developer proposes to employ before, during, and after the proposed development for the purpose of recognizing and managing unpredicted problems to valued components. The DAR must explain how the developer proposes to verify impact predictions and must also describe what alternative measures will be used in cases where a proposed mitigation measure does not produce the anticipated result.

Where available and applicable, the DAR should provide a review of relevant research, monitoring and follow up activities occurring in the South Slave and North Slave regions to the extent that the relevant information is available. The developer must particularly make every reasonable effort to verify, evaluate and compare the effectiveness of any proposed mitigation measures to those used at other development projects.

3.2.8 Cross referencing and presentation of information

The DAR must include a guide that clearly cross-references the requirements of the *Terms of Reference* to the information provided in the DAR. Where any information required by the *Terms of Reference* cannot be provided, the DAR shall include the reason for the omission. The DAR must include an index that will allow parties to quickly find relevant sections of the document. All mitigation measures proposed by the developer must be summarized in a “Table of Commitments” for easy reference.

The developer is encouraged to use modern technologies for presenting the information, including the use of hypertext for easy cross referencing. Similarly the use of maps, satellite imagery, photographs and other graphical depictions is encouraged, as is the use of non-technical plain language.

Where possible, geographic information, or data, should be submitted in a format that allows the Review Board and parties to conduct their own geographic information system (GIS) analysis. All GIS data must conform to the standards set by the GNWT’s spatial data warehouse⁶.

⁶ The GNWT’s spatial data warehouse may be accessed at <http://maps.gnwtgeomatics.nt.ca/portal/index.jsp>.

4 Key Lines of Inquiry

4.1 Introduction to Key Lines of Inquiry

Key Lines of Inquiry are areas of the greatest concern that require the most attention during the environmental assessment and the most rigorous analysis and detail in the DAR. Key Lines of Inquiry have been selected to ensure a comprehensive, detailed analysis of the issues that the Review Board has identified.

The three Key Lines of Inquiry deal principally with the biophysical environment. These are:

- Barren-ground caribou
- Water fluctuations in the Taltson River watershed
- Impacts to Trudel Creek

Because these are top priorities, they require the highest level of consideration by the developer. For each of these, the analysis must include expert evaluation in producing defensible predictions. Any of the Key Line of Inquiry involving valued components that are influenced by more than one human activity or development will require a more detailed cumulative effects analysis. Additionally, all the Review Board's expectations regarding assessment methods must be addressed for each Key Line of Inquiry.

The remainder of this section describes the Key Lines of Inquiry and provides specific information requirements where these have been identified in the environmental assessment.

4.1.1 Barren-ground caribou

Concerns regarding the potential impacts of industrial development on barren-ground caribou have been a key issue of environmental impact assessment in the Mackenzie Valley for a number of years. Aboriginal communities, in particular, have been quite vocal about their concerns for caribou. Caribou are not only an important food source for traditional land users, but also a key feature of Aboriginal culture. Sport hunting of caribou is also an important contributor to the NWT economy.

Impacts on caribou are likely to result in corresponding economic, social, and cultural impacts. Threats to caribou are seen not just from the proposed development alone but cumulatively from all other activities within their range.

Within this Key Line of Inquiry, the DAR must detail any effects the Expansion Project may have on caribou. In addition, the DAR must address how predicted changes to the abundance, health, distribution, and behavior of caribou as a result of the Expansion Project may affect the persons, communities and businesses that depend on this species.

For potential impacts on caribou, the geographical scope includes the portion of the range of any herd that may be potentially affected by any component or activity of the Expansion Project.

The DAR must explain how it has incorporated lessons learned from other developments within the Slave Geological Province if they are applicable. Lessons learned from similar developments in other circumpolar regions where caribou or reindeer are present should also be considered.

The DAR must outline management options for dealing with predicted impacts on caribou, as well as on any related socio-economic impacts. For situations where the proposed development is predicted to be only one of many sources of impacts, direct or indirect that combine in a cumulative manner, the DAR should outline what contributions this development makes to a cumulative problem.

The following specific information requirements have been identified and must be included in the caribou-specific impact analysis:

- a) Information on caribou herds with ranges that include the area of the proposed development (including population size, population characteristics, trends, range use patterns and condition);
- b) A description of any life stages (including calving, post calving, overwintering, and migration) during which each herd may interact with the proposed development;
- c) An estimate of the amount of habitat loss, change, degradation, or effective habitat loss to caribou;
- d) Identification of critical habitat, such as water crossings, where caribou may congregate, that are associated with project components;
- e) An analysis of the ways the proposed development may influence caribou population size and distribution. The analysis should be broken down into effects from individual project components;
- f) The identification of all components and associated activities of the development that may have an effect on caribou, regardless of whether they are in the developer's view significant or not;
- g) The identification of potential impacts on caribou from sources other than the proposed development, particularly those that may be influenced by the development. This must include a consideration of any potential development related changes to harvest levels for each potentially affected caribou herd, e.g. by creating additional access in the caribou range;
- h) The identification of all cumulative effects of other past, current, or reasonably foreseeable future developments within the range of each potentially affected caribou herd in combination with residual effects of the proposed development and its effects on other environmental components, such as predators;
- i) An outline of any potential measures or actions to minimize impacts and a discussion of the likelihood of success for each measure;

- j) An outline of any adaptive management strategies for any of the items listed above, as well as any plans for monitoring effects on caribou. Management strategies must be outlined where observed effects may be linked directly or indirectly to the proposed development.

4.1.2 Water fluctuations in the Taltson River watershed (excluding Trudel Creek)

The operation of a new control structure on Nonacho Lake and the construction of new generating facilities at Taltson Twin Gorges may result in substantial seasonal changes to the hydrological characteristics of the Taltson River Drainage Basin, both above and below Taltson Twin Gorges. Areas of concern include, but are not limited to: water quality and quantity, riparian vegetation, aquatic ecosystem effects, fish abundance and quality, impacts to benthos and other wildlife effects. The geographical scope of this Key Line of Inquiry includes all water bodies (and associated riparian areas) that may be potentially affected by the development; upstream of Taltson Twin Gorges and downstream to Great Slave Lake.

This section must also include:

- a) Effects of altered flows and changes to water quality on water bodies both upstream and downstream of the Taltson Twin Gorges;
- b) An analysis of the geographic extent of any hydrological effects, including under maximum ice thickness;
- c) A water balance for affected water bodies, including anticipated rates and timing of water level changes and flow rates and changes to the winter ice regime;
- d) Predicted effects on aquatic life that considers the timing and levels of increased and decreased flows and changes to water quality as it relates to aquatic life;
- e) A prediction on the potential for sedimentation to impact aquatic life as a result of the new flow regime, including a characterization of sediments and a consideration of sediment entrainment velocities;
- f) A comparison of projected post-expansion flow conditions to the baseline aquatic habitat study to determine the likely areas of habitat impact
- g) Identification of areas characterized by their level of importance to the aquatic life, including overwintering habitat;
- h) Identification of possible impacts to fish migration predicted as a result of flow regulation and control structures, including under maximum ice thickness;
- i) Mitigation strategies to minimize impacts to aquatic habitat and descriptions of impacts that are unavoidable;
- j) Effects that in-water works, such as the construction of the Nonacho control structure, will have on water quality and aquatic habitat;
- k) Assessment of the potential impacts on riparian habitat and associated wildlife, such as semi-aquatic fur-bearers and waterfowl, that use riparian habitat;

- l) Consideration of metal contaminants in sediments and fish tissue in the Taltson River from Nonacho Lake to Great Slave Lake and how these are likely to change under the proposed operating regime; and
- m) A prediction of the potential impacts to navigation based upon estimated high and low level water flows at different times and seasons for the year.

4.1.3 Ecological changes in Trudel Creek

The Expansion Project proposes to redirect substantial volumes of excess water currently flowing through Trudel Creek. The reduction of water flows in Trudel Creek, coupled, with sporadic changes in water flows during shutdown scenarios, may potentially affect the creek's ecology.

The developer must address the following items regarding potential impacts to Trudel Creek:

- a) An assessment of the expected environmental shift in Trudel Creek, including: water level fluctuation range, timing, duration and frequency, habitat shift and erosion potential;
- b) An assessment of the impacts to aquatic communities and habitat in Trudel Creek, including a prediction of the quantity and quality of aquatic habitat to be lost due to decreased flows;
- c) Possible changes to fish behavior including interruption of migration, spawning patterns and associated effects and changes in the behavior of wildlife species dependent on fish populations;
- d) The spatial extent of downstream effects and how these effects may change through time (seasonally and annually);
- e) The impacts of sudden extreme flow events in Trudel Creek in regards to aquatic life (including benthos), furbearers, erosion potential for channel banks and substrate, vegetation;
- f) A description of any impacts associated with the mitigation activities and potential effects of the mitigation activity;
- g) A discussion of the reversibility of impacts associated with water level changes and the ability of affected ecosystems to recover; and
- h) An assessment of the potential impact to harvesters who may hunt, fish, trap or travel in and around Trudel Creek.

5 Subjects of Note

5.1 Introduction to Subjects of Note

Subjects of Note require a thorough analysis, including a cumulative effects assessment component, but do not require the same level of detail as Key Lines of Inquiry. As a result of the scoping exercises and its own consideration, the Review Board's has defined twelve Subjects of Note.

Biophysical Subjects of Note are:

- Canal construction
- Turbine and conveyance canal operation
- Species at risk and key bird species
- Access
- Climate change
- Key furbearing species and ungulates

Socio-economic and cultural Subjects of Note are:

- Short and long-term employment and training
- Regional economic development
- Impacts on tourism potential and wilderness character
- Legacy issues
- Impacts on harvesting
- Heritage resources

5.2 Biophysical Subjects of Note

5.2.1 Canal construction

The developer proposes to excavate in sound rock, a water conveyance structure (North Gorge canal) that would a run a distance of 1250m. The construction of the structure may potentially impact the environment in a number of ways. The developer should present the following in the DAR:

- a) An assessment of the acid rock drainage potential of waste rock that is to be excavated from the site, including contingency plans for the management of any acid generating rock that might be discovered;
- b) Planning and management strategies for the extracted rock and overburden which should include:
 - I. Amount of land proposed to be affected by spoil pile;
 - II. Potential impact of runoff that may contain sediment and/or residual explosives;

- III. Water management for potentially contaminated runoff;
- IV. Spoil pile reclamation options;
- c) Predicted levels of noise and its impact on surrounding valued components due to explosions and heavy machinery operation related to canal excavation; and
- d) An assessment of the potential impact of dust generated by traffic, explosives, the exposed canal or the waste rock piles.

5.2.2 Turbine and conveyance canal operation

The developer proposes to install turbines into the North Gorge canal in addition to a small turbine on the Nonacho Lake control structure. The operation of a conveyance canal may provide new downstream fish passage to the lower portion of the Taltson watershed where little to no connection existed previously. The passage of fish through the conveyance canal and turbines may potentially impact fish and other aquatic life. The developer should present the following in the DAR:

- a) An assessment of the impact on fish populations associated with allowing upstream fish population to join downstream populations;
- b) An assessment of the impact on fish and fish passage through the conveyance canal and turbines; and
- c) Identification of mitigation measures to minimize impacts to fish and fish passage through the conveyance canal and turbines.

5.2.3 Species at risk and key bird species

As the proposed development traverses a number of ecological zones, particularly the tree line, it is expected that both species native to the northern boreal forest, as well as tundra species may be potentially affected.

For Species at Risk, the analysis provided in the DAR must be of sufficient detail to allow the Review Board, as well as relevant other parties, to discharge its responsibilities under the *Species at Risk Act*, which includes:

- a) Determining whether the proposed development is likely to affect a listed species or its critical habitat;
- b) Identifying the adverse effects on the species and its critical habitat;
- c) Ensuring that measures are taken to avoid or lessen those effects, consistent with any applicable recovery strategy and action plan; and
- d) Monitoring the effects.

For the purpose of this environmental assessment, the term “species at risk” includes all species listed under any applicable schedule of the *Species at Risk Act*, as well as any species listed by the Committee on the Status of Endangered Wildlife in Canada. It also includes any species listed by the GNWT with designations “may be at risk”, “at risk” or “sensitive” in the *General Status Rankings for Species in the NWT*.

For key bird species, the DAR must provide:

- a) All potential disturbances during nesting, rearing, molting, staging, and migration, (e.g. from construction activities, air traffic, as well as upstream and downstream effects of water flow changes);
- b) Characterization of the potential for bird mortality due to collision with transmission lines and development of potential mitigation measures related to this potential impact;
- c) Characterization of the transmission towers for their suitability as nesting and roosting sites for predators and the potential for increased predation facilitated by the development as well as potential mitigation measures to be considered, such as tower design;
- d) Identification of all potential alterations to bird habitat, including loss of habitat within the Expansion Project footprint, the creation of new habitat, and any downstream effects of water flow changes, with particular emphasis on waterfowl; and
- e) Identification of mitigation measures to avoid reduce impacts to birds, including precautions to be taken based on the seasonal life cycle of birds.

5.2.4 Access

Winter road construction and access concerns were raised in scoping exercises as a factor leading to a number of potential impacts. According to the *Project Description*, the 60 km temporary winter road from Fort Smith to the Taltson Twin Gorge facility will require temporary redevelopment. Additionally, a temporary winter road, approximately 150 km long is proposed to be constructed from Taltson Twin Gorges to Nonacho Lake.

The specific routing of the ice road during the construction phase on lakes and portages, the location and capacity of construction and maintenance camps, and the management of ice road traffic must be carefully considered. In the scoping exercises it was expressed that the ice road will provide access to an area that has been largely untouched except by aboriginal harvesters and that it is an area that continues to be used by trappers and hunters during the winter.

The geographical scope of this Subject of Note must include all access routes, including all waterbodies and land crossings used for the Fort Smith to Nonacho Lake temporary winter road.

The DAR must provide:

- a) A evaluation on the potential impacts that operation of the temporary winter road may have on erosion rates, sedimentation around portages, water withdrawal and generation of noise;
- b) An assessment of the potential of the temporary winter road to open a previously inaccessible area to hunters or recreational snowmobilers;
- c) A discussion of the potential impacts that increased access may have on the way of life of aboriginal persons who harvest in the vicinity of the development;

- d) Mitigation measures to address any potential impact associated with access to areas along the temporary winter road if deemed necessary;
- e) A discussion of how the developer intends to restore access routes back to nature and prevent longer term access by either humans or animals, if deemed necessary;
- f) Any plans by the developer, governments or communities to monitor the environmental effects of the temporary winter road and access route;
- g) Identification and assessment of potential impacts from water crossings, including mitigation measures to avoid or reduce impacts to the water bodies and aquatic life; and
- h) Identification of the potential impacts to navigational use and safety due to works on, in, near, over or under navigable waters, including stream crossings.

5.2.5 Climate change

A scientific consensus has been established that the North is particularly vulnerable to impacts from a changing climate. The Expansion Project is fairly unique in the NWT with regard to the fact that it may possibly serve to mitigate greenhouse gas generation in the NWT by displacing fossil fuel use in mining activities. The DAR should evaluate the development as a potential greenhouse gas mitigator. It must also examine the possible effects of climate change on the proposed development.

The Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment's *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*⁷ may be used for further guidance on climate change issue.

The analysis of this Subject of Note must include:

- a) The quantity of emissions (in absolute terms, as proportion of NWT industrial emissions, and as proportion of total NWT emissions) that the construction and operation of the project will cause;
- b) The quantity of emissions (in absolute terms, as proportion of NWT industrial emissions, and as proportion of NWT total emissions) that the Expansion Project is likely to mitigate or displace;
- c) The types of fuel and the types of industrial activities that the Expansion Project is proposed to mitigate against;
- d) Presentation of climate change scenarios and potential project issues associated with these scenarios, particularly the likely increase in climate variability and its associated impacts (e.g. Flood events, droughts).

⁷Federal-Provincial-Territorial Committee on Climate Change and Environmental Assessment, 2003. *Incorporating Climate Change Considerations in Environmental Assessment: General Guidance for Practitioners*. Available from the Canadian Environmental Assessment Agency website www.ceaa-acee.gc.ca/012/newguidance_e.htm .

- e) An outline of any specific adaptations of the development to climate change, as well as management options for a variety of future climate change effect scenarios.

5.2.6 Key furbearing species and ungulates

Concerns were expressed during the issue scoping exercises about the potential impacts that the development could have on key furbearing and ungulates (other than caribou) species, many of which are harvested by local communities. Because the proposed Expansion Project traverses both the northern boreal forest as well as the tundra there may be a wide range of key species that could be potentially affected.

All predicted effects listed in this section should be broken down according to specific project components. The information requirements regarding key furbearing species include:

- a) The abundance of key fur bearing species potentially affected by the project, as well as the frequency and time of year that such species can be found within the area of interest;
- b) A consideration of other developments within the region that may potentially impact populations of key fur bearing;
- c) An evaluation of the potential for development components to impact key fur bearing species, either by sensory disturbance or through site hazards;
- d) An assessment of the potential for increased key fur-bearing species harvesting resulting from increase access;
- e) A description of the likely habitat loss of key furbearing species to be incurred due to the Expansion Project; and
- f) A description of any measures that may be taken to avoid or reduce these impacts.

Specific information requirements regarding ungulates include:

- a) The abundance of ungulate species potentially affected by the project in the development areas, as well as the frequency and time of year that such species can be found within the area of interest;
- b) A consideration of other developments within the region that may potentially impact populations of ungulates;
- c) An evaluation of the potential for development components to impact ungulates, either by sensory disturbance or through site hazards;
- d) An assessment of the potential effects on movement and vulnerability to hunting that stem from linear development components, such as the ice road and transmission line right-of-way;
- e) An evaluation of the potential changes to the predator-prey relationship of any potentially affected ungulate population and predicted long term effects on the population; and

- f) A description of any measures that may be taken to avoid or reduce these impacts.

5.3 Socio-Economic Subjects of Note

5.3.1 Short and long-term employment and training

The DAR must provide an analysis of the opportunities available for employment during both construction and operation of the Expansion Project with a focus on residents of the NWT in general, and of the North and South Slave region in particular. The DAR must provide the following:

- a) A description of all employment requirements by skills category over the life of the project;
- b) A discussion concerning the numbers of employees who will be direct versus contractor employees, and whether and how the developer will require its contractors to have similar commitments to maximizing regional and Aboriginal employment;
- c) A discussion of where the likely labour pool “draw” is going to be from for this development, as well as a comparison to currently available NWT labour pool;
- d) A presentation of the developer’s strategies, plans or commitments with respect to maximizing the proportion of employees that are NWT residents, Aboriginal persons, and residents of potentially affected communities (e.g., through hiring policies, training initiatives);
- e) The identification of any barriers to employment, advancement and retention for Northern workers (with particular emphasis on residents of the South Slave regions), including minimum skill requirements, hiring policies related to criminal records or substance addictions, availability of willing employees, and access to training opportunities for community members;
- f) A description of the requirements for any training, education, and other improvements necessary to maximize employment of residents from potentially affected communities; and
- g) A listing of requirements for any training, education or other improvements necessary to maximize engagement of businesses from potentially-affected communities in the Expansion Project.

5.3.2 Regional economic development

The Expansion Project has the potential to become a long-term feature of economic development within the NWT. However during the scoping exercises, questions and concerns were raised about the potential of the Expansion Project to induce further development within the Slave Geologic Province. The DAR’s response to this section should include, but not be limited to:

- a) An analysis of the Expansion Project’s potential to capture revenue in the NWT through the provision of hydroelectric energy to the diamond mines that previous would have been supplied through diesel-fired generators;
- b) The potential economic impacts the Expansion Project would have on the trucking businesses which currently provide the diamond mines with diesel for power generation;
- c) A discussion of the likelihood for the Expansion Project to be able to provide electricity to Lutsel K’e and to the proposed East Arm National Park, as well as an assessment of the economic impact of such activities; and
- d) A discussion of the Expansion Project’s likelihood of facilitating further development in the Slave Geologic Province based upon the current electricity supply prediction, as well under a scenario where the hydroelectric resource is fully optimized (i.e., where the developer expands to maximum capacity based on demand).

5.3.3 Impacts on tourism potential and wilderness character

The construction of a proposed 690 kilometer hydroelectric transmission line from the Taltson Twin Gorges plant to the diamonds mines north of Great Slave Lake is a major component of the Expansion Project. The establishment of the line may, among other things, potentially affect Dene spiritual sites, visual and aesthetic qualities of the wilderness landscape, and have implications to the establishment of the East Arm National Park.

Tourism is an economic option for communities in both the North Slave and South Slave regions. Tourism in the NWT depends heavily on the wilderness character of the land. The development of industrial infrastructure and frequent air traffic may threaten that wilderness character, which has both an economic and an intrinsic value to many NWT residents and other Canadians. In response to these issues, the DAR must provide the following:

- a) Identification of any potential impacts that the construction and operation of the Expansion Project could have on the aesthetic or wilderness qualities as well as a discussion of mitigation options to deal with any predicted impacts.
- b) Identification of any land users who may be potentially impacted –economically (tourism operators), socially and/or culturally by the visual and aesthetic impacts of the proposed development.
- c) The location selection process and associated location maps for the proposed development in relation to the national park’s preliminary area of interest;
- d) A discussion of any potential impacts from the development on the proposed national park, which must include activities indirectly caused by the proposed development, such as activities potentially increased access into the area;
- e) A discussion of any particular landforms, locations of special interest, or other unique environments that merit special attention in the potentially affected area

and discuss any mitigation measures proposed to reduce potential impacts to them.

5.3.4 Legacy issues

The legacy of the construction of the original Taltson River Dam is an issue that still reverberates among member of the public, as was noted during scoping sessions. The Review Board understands that Dezé Energy Corporation does not appear legally liable for impacts alleged to have occurred as a result of the original Taltson River Dam development. However, given the depth of the public concern noted around these issues, the DAR is expected to provide the following:

- a) A description of the issues raised by members of the public in their consultations with Dezé Energy Corporation that arise from the legacy of the construction and operation of the original Taltson Twin Gorges Dam; and
- b) A discussion of any efforts made by the developer to ensure that such legacy concerns are avoided in the current design planning for the Expansion Project.

5.3.5 Impacts on harvesting and land use

Given the importance of wildlife harvesting as the cornerstone of traditional livelihoods, consideration must be given to any potential impacts the Expansion Project may have on land use and traditional harvesting activities. The DAR shall provide the following:

- a) A description of traditional land use patterns and the cultural identities of the land users in the potentially-impacted area;
- b) An evaluation of any potential direct and indirect impacts that the Expansion Project may, on its own and in combination with other cumulative developments, have on hunting, fishing and trapping for persons from the potentially-impacted communities;
- c) Identification of all mitigation measures required, as well as any commitments made by Dezé Energy Corporation, to mitigate against impacts on both traditional land use and resource harvesting from the land;
- d) Identification of potential impacts to harvesters due to alterations in navigational waters, stream crossing, or ice conditions (that may affect the movement of harvesters).
- e) Identification of land use, other than that for traditional activities, by communities of interest (recreation, tourism operators, non-aboriginal resource harvesters, industry), and any potential impacts on these users' ability to use the land.

5.3.6 Heritage resources

There is concern over possible negative impacts to heritage resources from the Expansion Project, especially given its extensive linear nature and the fact that it is proposed to cross important water bodies such as the Lockhart River system. The DAR must provide the following:

- a) How the developer has taken the presence of Dene sacred sites into consideration, particularly, but not limited to, The Lady of the Falls, in its planning for transmission line corridor;
- b) An examination of the potential impacts that the project components, particularly the transmission line, will have on the cultural landscape of the local aboriginal communities;
- c) A description of all known archaeological and heritage resources, as well as sites or areas of cultural significance in, or near the area of interest. To protect these resources, their exact locations should *not* be included in the DAR;
- d) Identification of any areas within the area of interest that have moderate to high probability of containing currently unknown cultural and/or heritage resources;
- e) A synopsis of the correspondence and consultations exchanged with experts (traditional knowledge holders, archaeologists, anthropologists) used to make the above assessments;
- f) A listing of all recommended mitigation measures identified for the protection of local known and high potential areas of cultural and heritage resources; and
- g) Identification of sacred sites and an assessment of the potential effects that the development's proximity might cause, as well as a discussion of any proposed mitigation measures.

6 Sustainability and Cumulative Effects Analysis

6.1.1 Project contribution to sustainable development

The Review Board's understanding of sustainable development is framed by the MVRMA's s115 *Guiding Principles* to have regard to the protection of the social, cultural and economic well-being of residents and communities in the Mackenzie Valley, the importance of conservation to the well-being and way of life of the Aboriginal peoples of Canada and the capacity of renewable resources to meet future needs. The DAR must speak to these principles.

The proposed development's contribution to sustainability and effects on future generations must be evaluated on the basis of:

- The extent to which it makes a positive overall contribution towards environmental, social, cultural and economic elements of sustainability;
- How the planning and design take into account the desire to contribute to sustainable development;
- How monitoring, management and reporting systems have incorporated indicators of sustainability; and
- The views of stakeholders and participants in the environmental assessment about whether the development promotes or threatens the pursuit of sustainable development.

6.1.2 Cumulative effects assessment

Concern over possible cumulative effects were raised during the issue scoping exercises. Cumulative impacts are an important consideration in the Review Board's environmental assessments. A number of the Key Lines of Inquiry and Subjects of Note require analysis of cumulative effects. In addition to providing a detailed response to such Key Lines of Inquiry and Subjects of Notes that require cumulative effects assessment, the DAR must contain a stand-alone cumulative section that provides sufficient information to allow the Review Board and parties to evaluate the significance of the proposed development's overall cumulative impact on the environment, without having to refer to other sections extensively. At minimum, this section in the DAR must provide summaries of the analysis and results for any cumulative effects assessment done and presented under any individual Key Lines of Inquiry or Subjects of Note. The cumulative effects assessment must follow the guidance of the Review Board's *Environmental Impact Assessment Guidelines*. Appendix H of these *Guidelines* refers specifically to cumulative effects assessment.

7 Remaining Issues

This section contains instructions to the developer for analyzing all individual issues identified in the EA scoping exercises that the Review Board views as being pertinent to the assessment.

The results of the scoping sessions have been broadly organized into either a bio-physical or a socio-economic category. The following tables include all the relevant issues and any specific information requirements identified during scoping that the Review Board believes are mostly linked to potential adverse impacts. The issues are intended to be comprehensive, and may include those issues emphasized in the previous sections.

For each issue listed, the developer is required in the DAR to reconcile whether it was assessed in a response to a Key Line of Inquiry or Subject of Note. If so, the developer must provide a reference accordingly. If not, the developer must provide sufficient analysis to demonstrate whether it is likely to cause significant impacts. Any issues that are not relevant to a Key Line of Inquiry or a Subject of Note do not require in-depth analysis beyond showing that significant impacts can be prevented with standard mitigation or regulatory conditions.

Table 7-1: Biophysical Issues

<p><i>Aquatic and Fish Issues</i></p> <ul style="list-style-type: none"> • Impediments to fish movement • Impacts of instream works on fish (Nonacho control structure) • Impacts of water crossings and barge operations on navigable waters • Impacts to fish habitat from reduced flow at Trudel Creek • Erosion from exposed banks in Trudel Creek • Sudden flood events in Trudel Creek with shutdowns • Changes to sediment deposition in affected water bodies • Changes in turbidity
<ul style="list-style-type: none"> • Habitat loss from new flow regime downstream of Nonacho Lake
<ul style="list-style-type: none"> • Impact from temporary winter road stream crossings
<ul style="list-style-type: none"> • Noise and vibration from ice road traffic
<ul style="list-style-type: none"> • Impacts of ANFO explosives
<p><i>Navigation and Transportation</i></p> <ul style="list-style-type: none"> • Potential impacts to safety of navigational from the construction of the transmission line • Potential impacts to aviation safety from the establishment of the transmission line • Potential impacts to navigational use of water bodies, including recreational and traditional use • Impacts to travel routes • Changes to access from new winter roads • Methods for on-going maintenance activities • Additional traffic on Tibbett to Contwoyto Ice Road to support substation construction
<p><i>Contamination and Reclamation</i></p> <ul style="list-style-type: none"> • Management of blast rock • Clearing for staging areas and barge landings
<ul style="list-style-type: none"> • Reclamation plans for work sites, staging areas, barge landings, stream crossings or winter roads
<ul style="list-style-type: none"> • Transportation and final location of waste rock
<ul style="list-style-type: none"> • Acid rock drainage from waste rock
<ul style="list-style-type: none"> • Fuel transportation and storage
<p><i>Transmission Line</i></p> <ul style="list-style-type: none"> • Impacts on vegetation • Visual disturbance • Raptor and raven nesting habitat
<ul style="list-style-type: none"> • Bird collision and electrocution
<ul style="list-style-type: none"> • Aural disturbance (humming from wires)
<ul style="list-style-type: none"> • Clearing along transmission corridor
<ul style="list-style-type: none"> • Health effects on animals from lines (electromagnetic radiation)
<ul style="list-style-type: none"> • Accidents and malfunctions

<ul style="list-style-type: none"> • Potential icing of transmission lines
<p>Wildlife</p> <ul style="list-style-type: none"> • Consideration of SARA and species of concern • Impacts on nesting and denning behaviours • Disturbance due to construction and maintenance activities
<ul style="list-style-type: none"> • Impacts of helicopter traffic
<ul style="list-style-type: none"> • Impact of access road on caribou
<ul style="list-style-type: none"> • Health and distribution of caribou
<ul style="list-style-type: none"> • Energy budget concerns of caribou
<ul style="list-style-type: none"> • Timing of development activities according to species

Table 7-2: Socio-Economic Issues

<p><i>Community Engagement</i></p> <ul style="list-style-type: none"> • Engagement with persons living near the transmission line • Engagement with persons living north of Great Slave Lake • Need for local knowledge and traditional knowledge input in project design • Role of community environmental monitors
<p><i>Access</i></p> <ul style="list-style-type: none"> • Restricting access on the temporary winter road from Fort Smith to the Twin Gorges • Predicted changes in ease of access • Effectiveness and location of any gating
<ul style="list-style-type: none"> • Potential future impacts of the road
<ul style="list-style-type: none"> • Routing of the winter road to minimize environmental impacts
<p><i>Alternatives to the Project</i></p> <ul style="list-style-type: none"> • Effects to continuing use of temporary Tibbett Lake winter road • Implication of wind energy development at mines <p><i>Energy Issues</i></p> <ul style="list-style-type: none"> • Ability of transmission line to provide power to East Arm National Park • Ability of transmission line to provide power to Lutsel K'e • Quantity of surplus power beyond diamond mine requirements • Maximum energy capacity the system could provide • Ease of upgrading the system to produce more electricity <p><i>Cumulative Effects</i></p> <ul style="list-style-type: none"> • Effects of multiple projects on community members • Effects of cheaper power on increasing rate of development • Amount of future development that can be supported <p><i>Traditional Harvesting and Lifestyles</i></p> <ul style="list-style-type: none"> • Concerns about increased number of people entering the region who may harvest wildlife due to access facilitated by the development • Preventing people from encountering hazards around dam site • Communication strategy to inform people about potential water levels • Potential impacts of project on harvesting success • Requirement of more information on trapping activities • Impact of development on people's relationship with the land • Need for local knowledge and traditional knowledge input in project design • Conduct of heritage resources assessments <p><i>Employment / Training</i></p> <ul style="list-style-type: none"> • Availability of long-term monitoring jobs for local people • Location of project headquarters and control station • Availability of training opportunities and funding for Youth and Aboriginals • Percentage of northern workers to be engaged in project • Effect of potential labour shortage on project • Employment impact of fewer fuel trucks going from YK to mines <p><i>Economic Details of the Project</i></p> <ul style="list-style-type: none"> • Commitment from the diamond mines to purchase power

- Potential of other prospective purchasers
- Economic feasibility of the project without Gahcho Kue
- Impact to the project of the mines developing their own alternate energy sources
- Economic feasibility of project after closure of diamond mines
- Length of time before project is profitable
- Increased income and capital for South Slave communities

8 Deliverables

The developer is expected to submit the DAR to the Review Board for a conformity analysis. Once in conformity, MVEIRB staff will provide direction to the developer for distribution of materials to parties. The DAR submission to the Review Board should include:

- 10 copies of the DAR in hardcopy (although once the DAR is determined to be in conformity with these *Terms of Reference*, copies will be required for all parties);
- The DAR in digital format with individual files not to exceed 5 MB in size and ideally with individual files being less than 3 MB in size (using only low-resolution images);
- A concordance table that clearly cross-references the *Terms of Reference* with the impact statement as part of the DAR;
- A commitments table listing all mitigation measures the developer commits to employ as part of the DAR;
- Associated maps (not including engineering drawings) as shape files in accordance with GNWT spatial data warehouse specifications; and
- Any supporting materials such as videos or animations that might enhance the understanding of the Review Board and the parties.

While preparing the DAR, the developer is encouraged to continue consulting with all parties to the EA. The developer is also encouraged to contact the Review Board office when the developer is unclear about any of the requirements of this *Terms of Reference* document, and to seek clarification in writing.