



Mackenzie Valley
Environmental Impact
Review Board

Terms of Reference and Work Plan
for the
Environmental Assessment
of
Tyhee NWT Corp's
Yellowknife Gold Project
EA0506-004

August 12th, 2005

Mackenzie Valley Environmental Impact Review Board

200 Scotia Centre

P.O. Box 938

Yellowknife, NT

X1A 2N7

Tel: (867) 766-7050

Fax: (867) 766-7074

Glossary of Acronyms

EA – Environmental assessment

DAR- Developer's assessment report

DFO – Department of Fisheries and Oceans

INAC – Indian and Northern Affairs Canada

MVEIRB – Mackenzie Valley Environmental Impact Review Board

MVRMA – Mackenzie Valley Resource Management Act

ToR – Terms of Reference and Work Plan

YGP – Yellowknife Gold Project

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Overview

This document outlines the process and the information required for the environmental assessment of a gold mining project proposed in the North Slave region of the Northwest Territories by Tyhee NWT Corp. It is divided into the following sections:

- Section 1 – Introduction, including the reasons for EA referral, as well as the legal context;
- Section 2 – The Scope of Development that is being proposed;
- Section 3 – The Scope of the Assessment, i.e. the issues that will be addressed in the EA;
- Section 4 – The Terms of Reference (ToR) that will direct the production of a *Developer's Assessment Report (DAR)*; and
- Section 5 – Definition of the responsibilities of those involved in the EA, as well as an overview of the EA process and a work plan.

I Referral to Environmental Assessment

Tyhee NWT Corp (Tyhee) applied for a Water License (MV2005L2-0003) and Land Use Permit (MV2005D0009) to the Mackenzie Valley Land and Water Board on March 18, 2005, in support of its proposed Yellowknife Gold Project (YGP or the "Development"); a 1500 tonne/day gold mining and milling operation. A *Project Description Report* and supporting appendices were filed by Tyhee as part of its application¹. The Mackenzie Valley Land and Water Board carried out a preliminary screening of the Development according to Section 124 of the *Mackenzie Valley Resource Management Act (MVRMA)*.

The Mackenzie Valley Land and Water Board completed its preliminary screening on May 4, 2005, and, pursuant to Section 125(1) of the MVRMA, decided to refer the application to environmental assessment based upon the likelihood that the proposed project might have a significant adverse impact on the environment. Specifically cited in the referral were the following concerns:

- The YGP's potential to generate acid rock drainage and the associated release of metals from waste rock and tailings; and
- The YGP's use of cyanide to extract gold from the floatation concentrate and the subsequent disposal of the leach residues in a tailings containment area to be constructed in Winter Lake, which will operate with a net release of water to the receiving environment.

The Review Board subsequently notified Tyhee that the YGP had been referred to environmental

¹ Copies of the *Project Description Report* have been distributed to all Parties to the EA who requested them. Electronic copies are available; contact the Review Board for more information.

impact assessment on May 6, 2005.

1.1 Legal Context

This EA is subject to the requirements of Part 5 of the MVRMA. It is also subject to the Review Board's *Rules of Procedure* and *Environmental Impact Assessment Guidelines*. Those documents can be accessed on the MVEIRB web site (www.mveirb.nt.ca) or by contacting the MVEIRB office for further information.

2 Scope of Development

Tyhee has applied to develop a gold mining and milling operation approximately 88 kilometers north of the City of Yellowknife on property adjacent to the historic Discovery Mine. Pursuant to section 117(1) of the MVRMA, the Review Board determined that the Scope of Development is that described in the *Project Description Report* submitted by Tyhee to the MVLWB, unless otherwise specified in this document. Alternatives identified in the ToR are also to be considered part of the Scope of Development.

The MVEIRB has defined the Scope of Development to consist of the following physical works or activities that will occur during the construction, operation and closure phases:

Mining Process

- Development of underground workings, portals, adits, raises, drifts, stopes and all other mine workings;
- Management of topsoil, waste rock and overburden stockpiles, including associated water treatment and management;
- Management of ore stockpiles, including associated water treatment;
- Storage and use of explosives;
- Management of rock with potential for metal leaching / acid rock drainage (ML/ARD);
- Transportation of ore from Ormsby Zone or Nicholas Lake deposits to the process plant;
- Mine dewatering and the management and treatment of mine water; and
- Mining equipment operation.

Milling Process

- Construction and operation of the process plant;
- Consumption of fresh water from Giauque Lake;
- Storage, handling, use and disposal of process chemicals;
- Disposal of process water and tailings; and
- Construction and operation of the tailing containment area, including recycling and disposal of process water, as well as its treatment and discharge to the receiving environment.

Support/Ancillary Facilities and Activities

- Transportation activities that support the YGP's operation, including use of the winter road for YGP specific support activities;
- Expansion of the winter road for the purpose of supporting YGP operations;
- Construction and use of all-weather roads;
- Stream crossings and any proposed modifications to water courses;
- Construction and use of drainage control structures;
- Development and use of borrow sources for aggregate production;
- Construction and operation of power plant and transmission infrastructure;
- Construction and operation of the change house, compressor house, offices, warehouses, storage yards, maintenance shops, laboratory and all other support buildings;
- Construction and operation of hydrocarbon storage and handling facilities;
- Construction and operation of camp facilities;
- Treatment of camp wastewater at Ormsby Zone and Nicholas Lake developments;
- Solid and hazardous management and construction and operation of containment areas; and
- Modification and operation of an existing airstrip or construction and operation of a new airstrip.

Closure and Reclamation Activities

- Removal of structures and equipment;
- Reclamation of the Tailings Containment Area;
- Reclamation of the road network
- Reclamation of infrastructure foundations;
- Re-vegetation of areas affected by mining ;
- Reclamation of waste rock and overburden piles; and
- Reclamation of the airstrip, roads, tailings caps, and quarries.

The Review Board recognizes that certain infrastructure associated with the Discovery Mine may also be included in the Scope of Development, depending upon negotiations between Indian and Northern Affairs Canada (INAC) and Tyhee.

3 Scope of Assessment

The Scope of Assessment is the determination of which issues and items will be examined in the EA as described in the ToR. The Review Board, after having reviewed Tyhee's *Project Description Report* and supporting appendices, requires more information on the potential social, economic, cultural and biophysical effects of the Development.

To better understand the information requirements of the interested parties who intend to participate in the EA, as well as to identify issues of public concern, the Review Board organized Issues Scoping Sessions in Yellowknife on June 15 and 16, 2005, and in Dettah on June 22, 2005. Results from the scoping sessions, in addition to the Review Board's own analysis and comments submitted from interested parties, are reflected in the items requested in Section 4 of this document. Reports of the scoping sessions are available on the MVEIRB's web site at: <http://www.mveirb.nt.ca/asp/Results.asp?ProjectID=60&cid=24>

The Review Board has determined the geographical scope of this EA to include Tyhee's mineral leases, mining claims and the Local Study Area². It will also consider project effects on all areas that may be affected in some identifiable way by the Development, including the Yellowknife River Basin downstream of the YGP, the ranges of wildlife using the area and the areas potentially-affected by transportation activities, including the winter road. The geographical scope for assessing effects to the human environment shall include, but not necessarily be limited to, the communities of Yellowknife, Dettah, N'Dilo, Rae-Edzo, Gameti, Wekweti and Wha Ti. The concerns of culturally-defined communities without a singular geographic scope, who use the land potentially-affected by the Development, such as the North Slave Métis, also merit consideration.

The Review Board recognizes that the determination of baseline conditions for this EA is complicated by the history of heavy industrial activity in the Local Study Area, particularly around the Ormsby Zone deposit and the Round Lake watershed. The Nicholas Lake area has seen fewer disturbances from past industrial activity, but nonetheless may also have been affected in a quantifiable way. The Review Board recognizes that it may be difficult to use quantitative methods to assess the effects of developments or activities that occurred in the distant past, particularly as it applies to establishing "baseline conditions". Older developments, for which insufficient data are available, may be treated in a more qualitative fashion where the best professional judgment or expert opinion is used, from either traditional knowledge or scientific sources.

Temporal boundaries for this EA must be set according to potential future effects, rather than just the duration of YGP operations. For example, the proposed Tailings Containment Area could affect local and regional water resources long after mining is completed. Therefore the temporal scope is determined to include all phases of the YGP, from construction to post-closure, until such time that no significant adverse impacts attributable to the Development are predicted to occur.

The scope of this EA will also include an examination of the cumulative impacts of past, present and reasonably foreseeable future developments. Such cumulative impacts will be assessed at a

² The Local Study Area as identified in Figure 2-1 (Page 16) of the *Project Description Report*.

geographic and temporal scale appropriate to the particular environmental component under consideration.

4 Terms of Reference

4.1 General Terms

Tyhee is to provide the Review Board with the information requested in section 4.2.

As a general consideration, Tyhee is reminded that the Review Board gives Traditional Knowledge equal weight to science in its deliberations. Tyhee therefore shall make all reasonable effort to collect and facilitate the collection of Traditional Knowledge relative to the YGP. Traditional Knowledge, where it is applicable, is to be used as a tool to evaluate the specific items required in Section 4.2. In the assessment of each environmental component, Tyhee shall identify all areas where it has attempted to engage with communities in the collection and/or sharing of Traditional Knowledge. Where Traditional Knowledge is determined by Tyhee to be not applicable, a rationale will be given for this determination. Where Traditional Knowledge is not available or not provided to Tyhee in a timely manner, despite appropriate diligence, Tyhee shall describe efforts taken to obtain it. The Review Board has recently released its *Guidelines for Incorporating Traditional Knowledge into the Environmental Impact Assessment Process*. While the YGP's referral to environmental impact assessment predates the enactment of these guidelines, Tyhee is strongly recommended to review and consider them in the preparation of its DAR. The guidelines are located on the MVEIRB's website at:

<http://www.mveirb.nt.ca/HTML/MVGuides/MVdocs.asp>.

In both the planning of the YGP, as well as for the assessment of potential effects, the effects of the physical environment on the Development, such as climate change or precipitation, must be considered in each of the applicable items of Section 4.2, including the Alternatives section. Any changes or modifications to the Development as a result of the effects of the environment should be noted in the relevant sections.

Tyhee should give materials, such as GIS data, to parties in a format that is utilizable for their purposes. Tyhee is encouraged to enter into discussions with parties who are seeking such information.

4.2 Specific Items

A Summary

- 1) Provide an English and Dogrib plain language, non-technical summary of the DAR;
- 2) Provide an audio translation of the plain language summary in the Dogrib language; and
- 3) Provide a table that cross references the items in the ToR with relevant sections of the DAR.

B Developer

Provide the following information regarding Tyhee NWT Corp:

- a. A summary the company's corporate history in Canada and the Northwest Territories;
- b. A discussion concerning the provision of financial security for government liabilities in the event of bankruptcy or other unforeseen failure to complete the project;
- c. A description of corporate and individual responsibilities for the proposed development and associated operations, including the governance relationship between Tyhee Development Corp and Tyhee NWT Corp;
- d. A discussion describing the relationship between the Tyhee NWT Corp and its' contractors and subcontractors and provide details as to how the company will ensure that the contractors and subcontractors will be responsible for, and honour commitments made by Tyhee NWT Corp;
- e. A detailed record of the environmental performance of the company and its contractors during exploratory work in support of the Development; and
- f. Any policy, directives or terms of reference concerning Tyhee's Environmental, Health and Safety Committee.

C Description of the Existing Environment

Preamble: *The Review Board will require a clear description of the baseline environmental conditions in which the proposed YGP will be situated. In order to understand any impacts that might be expected as a result of the YGP, Tyhee shall provide a textual and graphic depiction of the existing environment. The existing environment also includes contemporary/past land use and occupancy in the region. Include a discussion of any effects caused by past human activities which may have altered the background environmental conditions; identify their sources and provide, where available, any data on the degree of*

impact from such activities.

The Description of the Existing Environment shall include, but not be limited to the following:

- 1) Air, noise and climate;
- 2) Site hydrology, including surface water, shallow subsurface water and groundwater;
- 3) Surface, ground water and mine water quality and quantity;
- 4) Aquatic organisms (fish) and aquatic habitat;
- 5) Wildlife (including migratory birds) and wildlife habitat,(including current use and long-term variations);
- 6) Vegetation and plant communities;
- 7) Terrain, surficial geology, structural geology, mineralogy, bedrock geology, seismicity, permafrost;
- 8) Physical and chemical makeup of soils and lake sediments, including those from Giauque Lake;
- 9) Socio-economic conditions, including social services provision capacity among the potentially-impacted communities;
- 10) Historic and present past land usage, with the identification of traditional land use groups; and
- 11) Cultural and heritage resources, with the identification of the cultural groups who associate with these resources.

D Development Description

Preamble: *The Review Board requires a description of the YGP. In this section Tyhee is only asked to provide details on the Development itself, not to comment on potential effects from the Development. It should be noted that a lack of detail concerning the Nicholas Lake component of the YGP was identified both in the MVEIRB's review of the Project Description Report, as well as by parties who participated in the Issues Scoping Sessions. Tyhee is strongly advised to ensure that an adequate description of its planned activities at Nicholas Lake is included in the DAR. The use of detailed maps or other visual tools in the depiction of the proposed infrastructure is encouraged.*

The Development Description shall include, but not be limited to the following:

- 1) All existing or proposed access roads in the project area that Tyhee requires or anticipates will be necessary for the Ormsby and Nicholas Lake development; Tyhee's

winter road requirements should be considered as well;

- 2) Aggregate sources that Tyhee intends to utilize for construction, operational and reclamation purposes. The description should provide information on the timing of use and predicted amounts of material required over the life of the YGP, as well as an estimate of the volume of extractable quantities at the eskers that may be utilized for aggregate extraction and acid rock drainage potential;
- 3) A description of the solid and hazardous waste facilities, which should provide their location, conceptual designs of the facilities and an estimate of the volume of material that can be reasonably be expected to be deposited in the solid waste site;
- 4) A description of ore, waste rock, soil and overburden storage facilities, including water management and treatment considerations;
- 5) A description of the Tailings Containment Area, including preliminary designs for the internal dyke, control structure, polishing area and any water treatment scenarios;
- 6) A description of the process plant, milling facility and its support infrastructure;
- 7) A full description of infrastructure proposed for the Nicholas Lake development, including camp facilities and water treatment considerations;
- 8) A description of water intake infrastructure to be located at Giauque Lake, including a plan for the location of pipelines and other related infrastructure;
- 9) The exact location and description of any existing airstrip, or details concerning the construction and operation of an airstrip suitable to support the mine;
- 10) A description of all water management structures, including preliminary plans of diversion and water treatment structures;
- 11) A description of the types of explosive to be used, their storage, handling and application;
- 12) A description of human resource requirements and details concerning proposed work scheduling; and
- 13) An estimate of the mine life including construction, operation and post-mining closure and reclamation phases

E Alternatives

Preamble: *The Review Board requires that alternatives approaches to planning, developing, operating and closing the YGP are considered in the DAR. The Review Board has listed a number of areas where it believes alternatives should be considered. Where alternatives that would mitigate adverse impacts on the environment and/or enhance the socio-economic performance of the proposed mine are deemed not feasible, economically or otherwise, the engineering and economic analysis to determine feasibility shall be*

summarized and presented. Where uncertainty exists about the merits of competing alternatives, an assessment of the potential effects on the environment of each alternative will be included in this section³ Indicate where, in the course of community consultation, the YGP design has been altered to incorporate community values or concerns. Where alternatives to the current approach have been requested but not acted upon, describe why.

- 1) Provide a detailed evaluation and comparison of Tailings Containment Area alternatives to Winter Lake, including an evaluation of other alternatives in combination with paste backfill of the underground workings;
- 2) Evaluate the possibility of using alternate milling processes that would not require the use of cyanide, including a discussion of the properties of the ore, at both Ormsby Zone and Nicholas Lake deposits and their suitability to various technologies;
- 3) Evaluate alternatives, such as rock crushing, to produce aggregate other than developing local esker formations;
- 4) Evaluate alternatives to transporting ore from Nicolas Lake to the process plant other than by all-season road;
- 5) Evaluate alternative locations of the airstrip, other than on the Discovery Mine tailings cap;
- 6) Evaluate alternatives to diesel power generation, with particular consideration to utilizing hydro-electric power, as well as possibilities for co-generation;
- 7) Evaluate alternatives for the winter re-supply road, such as using the existing Lupin Mine road rather than opening and maintaining a second road in the area;
- 8) Discuss alternative employee work schedules and living conditions while on site; and
- 9) Evaluate alternative mine development schedules that consider extending the time required to mine and mill the currently-estimated ore reserve.

F Public Consultation

Preamble: *The purpose of public consultation is to provide those who might be potentially affected by the proposed Development with the opportunity to participate in the EA. Consultation with any community, aboriginal group or other organization with interests related to areas that might be affected by the Development should be considered in this section. Reasonable effort must be made and the results shown of this consultation effort.*

The following items are required for consideration of Public Consultation:

³ In such applicable cases, the alternatives must be examined with respect to any effects the environment may have on the options (i.e. geotechnical or groundwater considerations).

- 1) In addition to identifying consultation dates, individuals and organizations consulted with, and discussion topics, as noted in Appendix G of the *Project Description Report*, identify and reference the following:
 - a. Methods used to identify, inform and solicit input from potentially-interested parties;
 - b. All commitments and agreements made in response to issues raised by the public during these consultations, and how these commitments altered the planning of the proposed YGP; and
 - c. All issues that remain unresolved, and document any further efforts envisioned by the parties to resolve them.
- 2) Identification of any plans, strategies or commitments of Tyhee, alone or in combination with any other group, to maintain consultation ties in a set forum during the EA process and throughout the life of the YGP;
- 3) A discussion of Tyhee's consultation plan that specifically focuses upon the holders of aboriginal and Treaty rights in project area. This should consider how the concerns and issues of such rights holders will be accommodated; and
- 4) A discussion as to how Tyhee intends to engage with traditional knowledge holders in order to collect relevant information for the establishment of baseline conditions, the prediction of possible impacts, as well as the development of mitigation methods, adaptive management plans and monitoring program planning.⁴

G Assessment Boundaries

Preamble: *The spatial boundaries for this EA should be set according to the boundaries for the valued component being assessed, rather than solely using the Local Study Area established in the Project Description Report. The study area for potential effects on terrain, for instance, may be limited to those watersheds or sub-watersheds in which development takes places. The study area for air quality, on the other hand, will likely encompass a larger area and will be based on prevailing wind conditions rather than physical features in the landscape. The spatial boundaries for the social, economic and cultural impact assessment should include those communities where a discernable effect may be expected (These will be considered the potentially-affected communities for the EA).*

Provide the following information regarding Assessment Boundaries:

- 1) A rationale for Tyhee's establishment of spatial boundaries for the assessment of potential effects noted in the following sub-sections. The spatial boundary should be appropriate

⁴ Suggestions for working with communities to obtain traditional knowledge are described in Section 4 of the Review Board's Guidelines for Incorporating Traditional Knowledge in Environmental Impact Assessment

to the nature of each valued component being assessed. Where the spatial assessment boundaries differ from the Scope of Assessment established in this ToR, please provide a rationale to explain the difference.

- 2) A rationale for setting temporal boundaries for the assessment of effects noted in the following sub-sections. The temporal boundary should be appropriate to the nature of valued component being assessed.

Note: Section K (Cumulative Effects) asks for additional identification of geographic and temporal scales of assessment.

H Human Environment

Preamble: *Assessment of the human environment (social, economic and cultural impact assessment) is an important part of any EA in the Mackenzie Valley, in relation to both the identification of potential adverse impacts on the environment and of public concern. The Review Board takes social, economic and cultural impact assessment very seriously and the impact assessment process should follow procedures as rigorous as those used in the assessment of biophysical environment. Experience has shown the determination of social, economic and cultural effects is most effective when the developer works with potentially-affected communities in an iterative way through each step of the environmental assessment, from issues scoping through to significance prediction and impact mitigation. The developer will make all reasonable efforts to include potentially-affected communities in the assessment of potential social, economic and cultural effects, and document those efforts. Effects identified during the course of the EA that are not considered in the DAR will also be open to Review Board consideration. The DAR should examine all components of the human environment that might be affected by the YGP, whether those effects are beneficial or adverse.*

In addition to considering the specific questions posed in this section, the developer is required to consider the following impact assessment steps for each of the subsections herein. In assessing the different effects on the human environment, the DAR will, in each subsection, at minimum:

- Include a rationale for determining which communities are being included in the assessment;
- Identify any valued social, economic or cultural components used, and how they were determined and how they will be carried forward into the various ongoing monitoring programs;
- For each valued component, identify and provide a rationale for the criteria and indicators used to measure any historical and current baseline conditions;
- Identify the sources, timelines and methods used in data collection;
- Clearly identify the baseline conditions, both historic and current, including analysis of any discernible trends;
- Identify any potential direct or indirect beneficial or adverse effects on the valued social, economic or cultural components that may occur or be accentuated because of the proposed development, along with a description of all assumptions used in this analysis;
- Predict the likelihood of each effect occurring, prior to mitigation measures being implemented;
- Describe any plans, strategies or commitments to avoid, mitigate or manage identified potential adverse effects; and
- Assess the significance of any residual adverse impacts estimated to remain after the imposition of mitigation measures.

When describing impacts and assessing their significance, Tyhee NWT Corp must characterize the impact by:

- The nature or type of the impact;
- The direction of the impact (i.e., beneficial vs. adverse);
- The magnitude of the impact;
- The geographic range of the impact;;
- The timing of the impact (including duration, frequency and extent);
- The likelihood of the impact occurring; and
- The reversibility of the impact.

Together, these seven criteria shall be used by the Developer as a basis for *its opinions* on significance. (For information on the MVEIRB's own ultimate determination of significance, consult the *Environmental Impact Assessment Guidelines* n 30 \)

H-1 Economy:

Preamble: *The Review Board, in each EA, is required to have regard for the economic well-being of the residents and communities of the Mackenzie Valley. Understanding the effects of a development on economic well-being requires in-depth analysis of what sorts of effects will occur, how they will be distributed geographically and among populations, and how adverse impacts can be mitigated. Tyhee will assess the potential effects of the YGP on the economies of the North Slave and Tlicho regions, the NWT as a whole and each of the identified potentially-affected communities. Where the Review Board feels that smaller and/or more vulnerable potentially-affected communities merit additional consideration, it is noted in the requirements herein.*

While conducting an assessment based on identified valued components, specific consideration shall

be given to, but not be limited to:

Direct Employment

- 1) Providing an updated listing of all employment requirements by skills category over the life of the YGP, based on the most current mine feasibility work;
- 2) Conducting an assessment of the available labour pool, at varying geographic scales, to meet the direct mine labour requirements, including: local small communities, Yellowknife, the North Slave and Tlicho regions, territorial, extra-territorial;
- 3) Providing information on any identified barriers to employment, advancement and retention for Northern workers (with particular emphasis on residents of smaller potentially-affected communities), including minimum skill requirements, availability of employees, and lack of training opportunities for community members;
- 4) Discussing Tyhee's strategies, plans or commitments with respect to maximizing the proportion of direct mine employees that are NWT residents, aboriginal persons, and residents of potentially-affected communities;
- 5) Assessing the requirements for any training, education, and other improvements necessary to maximize employment of residents of potentially-affected communities (differentiating between smaller communities and Yellowknife) in the workforce of the mine; and
- 6) Discussing on Tyhee's strategies to retain northern and aboriginal employees.

Business Development

- 1) Providing an estimate of required contractor and subcontractor goods and services required through the different stages of the project life cycle, and associated direct and indirect economic effects;
- 2) Identifying and assessing the opportunities for local, regional and territorial businesses to supply the required goods and services, both directly to the proposed development, as well as to meet new demand created by economic growth spurred by the YGP. Include estimates of what percentage of goods and services might feasibly be provided by northern businesses, and discuss any plans, commitments or strategies Tyhee has for maximizing this percentage;
- 3) Assessing the requirements for any training, education or other improvements necessary to maximize engagement of businesses of each potentially-affected community in the economic benefits accruable from the proposed development;
- 4) Assessing how the YGP will contribute to opportunities to diversify the economic base at the local, regional and territorial level. New local and regional economic development

associated with the YGP, including the production and supply of new goods and services, should be included in this assessment; and

- 5) Assessing how the Development will help prepare potentially-affected communities (with emphasis on smaller communities) for the eventual transition to a post-mining economy, and to develop the ability to withstand future economic fluctuations.

Distribution of Beneficial and Adverse Economic Impacts

- 1) Listing estimates of all predicted economic impacts, both beneficial and adverse, stemming from the YGP, including but not limited to:
 - a. Gross revenues and expenditures related to all phases of the YGP, including the commodity price assumptions underlying project valuation estimates;
 - b. Federal, territorial and municipal taxes to be remitted by Tyhee, and from linked economic development; this should take the effect of commodity price fluctuations into account;
 - c. Employment numbers, including a prediction of employment multipliers, and estimated effect on employment levels in potentially-impacted communities;
 - d. Predicted increases in local income and disposable income levels;
 - e. Information of what potential effect the YGP will have on local and regional inflationary pressures and cost of living;
 - f. Any increases in physical and social service infrastructure predicted to be required as a result of the YGP; and
 - g. Possible effect of the YGP on other types of economic activity occurring in the potentially-affected communities, with emphasis on the traditional economy.
- 2) Estimating, for each of the items listed above, how the economic effects identified will be distributed among potentially-affected communities. An estimate is required of how much of the economic benefit of the Development will accrue to smaller communities in the North Slave and Tlicho regions, Yellowknife, the NWT, and other Canadian jurisdictions, as well as among all identified potentially-affected communities;
- 3) Assessing the economic impacts of in- and out-migration among potentially-affected communities in the North Slave and Tlicho regions;
- 4) Assessing any pressures on organizations and businesses servicing the region, including those who maintain infrastructure or provide social services, caused by:
 - a. The mobilization of local labour away from potentially-affected communities to the YGP workforce;

- b. Socio-economic effects associated with increasing disposable income and a larger reliance on the wage economy.
- 5) Assessing any particular sub-populations within potentially-affected communities that are more vulnerable to any of the discussed potential economic impacts;
- 6) Identifying lessons learned from economic impacts of previous mine developments in the NWT and the North, and how they have been incorporated into the impact identification, prediction and mitigation for this development; and
- 7) Including, for each of the above, any plans, strategies or commitments designed to mitigate the identified adverse impacts.

H-2 Society and Culture

Preamble: *The MVRMA requires the identification and mitigation of adverse impacts on the social and cultural environments as part of the EA process. This includes direct and indirect effects of the development itself, including the relationship between development-related economic changes and social and cultural outcomes. Tyhee will use recognized social science methods, community input and TK, to undertake this social and cultural impact assessment.*

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to:

- 1) Community/population health and associated indicators such as, but not limited to:
 - a. Alcohol and drug use;
 - b. Family violence;
 - c. Housing pressures; and
 - d. Educational access and education completion levels.
- 2) The physical, mental, and cultural health of mine workers and mine workers' families;
- 3) The existing and required social services networks necessary to support community health and wellness;
- 4) The effect of this and other past, present and reasonably foreseeable developments on the political development, social development, cultural values, traditions and language among potentially-affected communities;
- 5) A description, for each identified potential effect, as to how the YGP may effect valued social and cultural components:
 - a. At the regional level;
 - b. At the local level for each potential-affected community; and

- c. Among particularly vulnerable sub-populations with potentially-impacted communities, such as women, children and elders.
- 6) An identification of lessons learned from social and cultural impacts of previous mine developments in the NWT and the North, and how they have been incorporated into the impact identification, prediction and mitigation for this development;
- 7) A discussion concerning the development of a Human Resources Management Plan and any programs that will be offered at the mine site to identify and mitigate social problems; and
- 8) An evaluation of beneficial and adverse socio-economic impacts in Yellowknife in comparison to smaller communities, focusing on the distribution of the impacts.

H-3 Heritage Resources

Preamble: *The protection of known or potential heritage resources is an essential element of EA in the Mackenzie Valley. The MVRMA definition of “impact on the environment” expressly recognizes effects on heritage resources.*

While conducting an impact assessment of how the YGP will potentially impact heritage resources, specific consideration shall be given to, but not be limited to:

- 1) Identifying all known archaeological and heritage resources, as well as sites or areas of cultural significance in or near the Local Study Area. To protect these resources, their exact locations should NOT be included in the DAR;
- 2) Identifying any areas within the Local Study Area that have medium to high probability of containing currently unknown cultural and/or heritage resources; and
- 3) Listing all correspondence and consultation with experts (traditional knowledge holders, archaeologists, and anthropologists) used to make the above assessments. List all recommended mitigation measures identified for the protection of local known and high potential areas of cultural and heritage resources. Particular emphasis should be put on engaging local Traditional Knowledge holders in this process.

H-4 Traditional and Contemporary Land Use and Wildlife Harvesting

Preamble: *Effects on wildlife harvesting are recognized by the MVRMA as an “impact on the environment” that must be considered by the Review Board. Given the essential role of communal land use and associated wildlife harvesting as the engine of the traditional economy, consideration must be given to any potential effects the Development will have on land use and traditional economic harvesting activities. In addition, contemporary land usage is an important element of the social, economic and cultural well-being of area users.*

While conducting an impact assessment of how the YGP will potentially affect Traditional and Contemporary Land Use and Wildlife Harvesting, specific consideration shall be given to, but not be limited to:

- 1) Describing any potential direct and indirect effects that the YGP may, on its own or in combination with other developments, have on hunting, fishing, trapping and other activities for persons and organizations from the potentially-affected communities; and
- 2) Identifying all measures required, and commitments made, by Tyhee to mitigate against adverse effects on both traditional land use and resource harvesting from the land.

H-5 Protected and Withdrawn Areas

- 1) Identify any locations within, proximate to, or potentially affected by YGP operations, that are currently protected by law, subject to special management rules and regulations, are identified in the NWT Protected Areas Strategy, or are proposed to become withdrawn areas in the future. These areas can be identified through consultation with community leaders and staff of the NWT Protected Areas Strategy.

H-6 Visual Resources and Wilderness Values

- 1) Identify any particular landforms, locations of special interest, or other unique environments that merit special attention in the areas potentially affected by the YGP and discuss any mitigation measures proposed to reduce potential adverse impacts to them. Analysis of the nearby esker identified as a potential gravel source and/or airstrip is specifically required;
- 2) Discuss the potential visual effects of the proposed development; and
- 3) Identify any other area users who may be economically, socially or culturally affected by potential effects of the YGP on visual resources and wilderness values.

H-7 Human Environment Monitoring

The assessment, monitoring and adaptive management of social, economic and cultural effects related to the Development is an essential EA consideration. Include descriptions of any commitments, plans and strategies that are proposed to monitor the following:

- Business opportunities;
- Employment, continued education and training;
- Mitigation of adverse social impacts;
- Traditional harvesting; and

- Worker and community health and wellness.

In addition, include any plans, commitments or strategies on how/whether human environment monitoring results will be reported to regulators and potentially-affected communities.

Where there are no commitments, plans or strategies to monitor these or other *identified* impacts/issues, give an explanation for their absence. Additionally, report on any discussions with communities, federal and territorial governments related to the development of Impact Benefit or Socio-economic Agreements, or similar collaborative tools to monitor and mitigate any of the above. Include a discussion of Tyhee's general approach, if any, toward negotiating such agreements.

I Biophysical Environment

In addition to considering the specific questions posed in this section, the developer is required to address the following impact assessment steps for each of the subsections herein. In assessing the different effects on the physical and biological environment, the DAR will in each subsection minimum:

- Identify any valued components (VCs) used, and how they were determined and how they will be carried forward into the various ongoing monitoring programs;
- For each valued component, identify and provide a rationale for the criteria and indicators used to measure any historical and current baseline conditions;
- Identify the sources, timelines and methods used for data collection;
- Clearly identify the baseline conditions, both historic and current, including analysis of any discernible trends;
- Identify any potential direct or indirect effects on the VCs that may occur or be accentuated as a result the proposed development, along with a description of all assumptions used in this analysis;
- Predict the likelihood of each effect occurring, prior to mitigation measures being implemented;
- Describe any plans, strategies or commitments to avoid, mitigate or manage the identified potential adverse impacts; and
- Assess the significance of any residual adverse impacts estimated to remain after the imposition of mitigation measures.

When describing impacts and assessing their significance, Tyhee NWT Corp must characterize the impact by:

- The nature or type of the impact
- The direction of the impact (i.e., beneficial vs. adverse);
- The magnitude of the impact;
- The geographic range of the impact;;
- The timing of the impact (including duration, frequency and extent);
- The likelihood of the impact occurring; and
- The reversibility of the impact.

Those seven criteria shall be used by the Developer as a basis for *its opinions* on significance. (For information on the MVEIRB's own ultimate determination of significance, consult the *Environmental Impact Assessment Guidelines* p.30.)

I-1 Water Resources

Preamble: *In the Review Board's scoping sessions, the potential effect to water quality was identified as a major EA issue. It is acknowledged that the YGP will be required to adopt the Metal Mines Effluent Regulations, which includes Environmental Effects Monitoring. However, it is the Review Board's task to assess the YGP's potential impact to water quality, regardless of any applicable regulatory legislation, as significant adverse impacts to water may still occur despite the observance of the Metal Mines Effluent Regulations or other relevant legislation. In regards to specific concerns, the issue of effects to water occurring due to the potential generation of acid rock drainage has been recognized. Additionally, the potential effect from the discharge of cyanide and metal-containing effluent into the environment was also*

raised.

Notable among water quality concerns expressed by parties thus far have been the YGP's use of cyanide, possible adverse impacts to Yellowknife's drinking water and the effect of the Con, Giant and Discovery Mines concerning gold mining's effects on water.

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to the following:

- 1) A listing of all applicable water resource permits, licences, and authorizations that will be required from federal, territorial and settlement area regulatory authorities;
- 2) A discussion of any metal and other water quality parameters, not listed under Schedule 4 of the *Metal Mines Effluent Regulations*, which may be concern for effluent discharged into the receiving environment;
- 3) An examination of the potential effects of the YGP on water quality downstream of the proposed Tailings Containment Area, Ormsby development and Nicolas Lake development, which shall include, but not be limited to:
 - a. A prediction of the quality and quantity of effluent discharged to the receiving environment that shall address all applicable water quality parameters including concentrations of metals, nutrients, major ions, process chemicals and bacteria;
 - b. A detailed conceptual plan of the management and treatment of effluent emitted from the Tailings Containment Area, Ormsby development and Nicholas Lake development;
 - c. A prediction of contaminant loading and dispersion into the receiving environment, from the Tailings Containment Area, Ormsby development and Nicholas Lake development effluent during mine operation and after closure;
 - d. The potential effect of YGP operations on increasing contaminant concentrations in the sediments of Narrow and Nicholas Lake; and
 - e. The potential effects from the discharge of nutrients (i.e. ammonia, nitrates & sewage) to the receiving environment, which shall include possible trophic changes in downstream water bodies.
- 4) A discussion concerning the *Metal Mines Effluent Regulations* and its role in the YGP's operation, which shall include, but not be limited to:
 - a. An overview of the *Metal Mines Effluent Regulations* and its proposed application in the YGP;
 - b. A description of the conceptual Effluent and Water Quality Monitoring Studies to be conducted under the *Environmental Effects Monitoring* portion of the *Metal*

Mines Effluent Regulations;

- c. A description of the conceptual Biological Monitoring Studies to be conducted under the *Environmental Effects Monitoring* portion of the *Metal Mines Effluent Regulations*;
 - d. The applicability of the results to be generated by the studies identified in items b) and c) to the site-specific northern conditions of the YGP area;
 - e. A discussion of the suitability of the species proposed to be tested in the Biological Monitoring Studies to draw conclusions about the potential effects on northern organisms; and
 - f. Discussion on any metals and other water quality parameters, not listed under Schedule 4 of the *Metal Mines Effluent Regulations*, which may still be of concern for the effluent discharged into the receiving environment.
- 5) An assessment of the YGP's capacity to meet water quality parameters and monitoring requirements in excess of those prescribed in the *Metal Mines Effluent Regulations* if the impacts to water quality, notwithstanding *Metal Mines Effluent Regulations* compliance, are predicted to be significantly adverse;
- 6) An assessment of the potential effects of YGP operations on promoting erosion and sedimentation;
- 7) An assessment of the potential effects of mine water discharge from the Ormsby and Nicholas Lake developments, which shall include, but not be limited to the following:
- a. Predicted quality and quantity of mine water that will be discharged into the receiving environment from the mine workings;
 - b. Water balance predictions and contingencies for potential higher than expected inflows to the mine workings;
 - c. Mine de-watering effects on the hydrology, groundwater flows and chemistry of the local study area; and
 - d. A discussion regarding the potential effects of the mine working, following closure, on the surrounding ground water regime with specific consideration if paste backfill is employed at the sites.
- 8) The potential effects of YGP operations on the quality, quantity and behaviour of sub-surface water flows, which must include the underground workings and groundwater flows for both the Ormsby and Nicholas Lake developments;
- 9) The potential effects of YGP operations on the hydrology and water balance of the areas potentially affected by the Development, which shall include, but not be limited to:

- a. Predicted changes in timing, volume and deviation of peak and minimum water flows resulting from the Development;
 - b. Water balance effects from the operation of the Tailings Containment Area; and
 - c. Water drawdown on the water balance of Giauque Lake.
- 10) The potential effects of the YGP on the promotion of metal leaching and acid rock drainage, which should include but not be limited to the following:
- a. A discussion of the results of metal leaching and acid rock drainage testing for tailings, waste rock and low-grade ore generated through YGP operations and their implications on water quality; and
 - b. Conceptual procedures for the identification, segregation, management and disposal of rock with potential for metal leaching and acid rock drainage.
- 11) The role that YGP activities will have on the discharge of heavy metals, including arsenic, into the receiving environment and its potential impact on water quality;
- 12) The role that YGP activities will have on the discharge of cyanide into the receiving aquatic environment and its potential effect on water quality;
- 13) A discussion of the potential effect that YGP activities will have on the Yellowknife River basin downstream of the Development with particular emphasis on likely effects to the City of Yellowknife's drinking water quality, and a description of potential adverse impacts stemming from a worst-case scenario. The possible establishment of remote water quality monitoring points shall be considered in addressing this discussion;
- 14) The potential effects that water intake activities from Giauque Lake, and associated infrastructure, will have on the lake's contaminated sediments; and
- 15) The provision of a conceptual plan for water quality management that shall include, but not be limited to the following aspects:
- a. The development of an aquatic effects monitoring program that will consider water quality and quantity, fish and aquatic habitat monitoring (*per Section I-2*);
 - b. A discussion around how Traditional Knowledge and other community input was used – e.g., in adopting water quality monitoring practices and parameters that have been identified and supported by potentially-affected communities;
 - c. A discussion concerning the implementation of an “Adaptive Management” strategy to address adverse impacts to water quality, quantity, aquatic organisms and aquatic habitat that are identified in the course of YGP operations; and
 - d. A discussion as to how Tyhee will report results to regulators and potentially-

affected communities.

I-2 Fish and Aquatic Habitat

Preamble: *Potential direct and indirect effects to aquatic animals (fish) and their habitat were identified as issues of concern throughout the MVEIRB's scoping exercises. Some of the major items raised were impacts associated with the location and construction of the Tailings Containment Area, as well as potential effects to aquatic habitat quality downstream of the Tailings Containment Area and effects associated with the footprints of infrastructure to be developed. Public concern has also been noted concerning the YGP's potential to further contribute to the contamination of local fish stocks. This is a concern that is at least partially attributable to the legacy of Discovery Mine.*

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to:

- 1) The potential effects of YGP operations on Giauque Lake's aquatic organisms and habitat which shall include, but not be limited to:
 - a. The potential effects of freshwater withdrawal on Giauque Lake's over-wintering habitat, littoral habitat and oxygen concentration; and
 - b. The potential effect of the freshwater intake and supporting infrastructure footprints.
- 2) The potential downstream effects of all effluents originating from YGP operations on aquatic organisms and their habitat. This should consider, but not be limited to effluent from the Tailings Containment Area, Ormsby development and Nicholas Lake development infrastructure, roads and borrow areas;
- 3) The potential effects of YGP operations on the aquatic organisms and habitat of Nicholas Lake with specific regard to any proposed infrastructure that may be located in aquatic habitat, as well as fresh water withdrawal from Nicholas Lake for mining and camp purposes;
- 4) The potential effects of YGP operations on the aquatic organisms and habitat of Narrow Lake with specific regard to any proposed infrastructure that may be located in aquatic habitat there;
- 5) An assessment of Winter Lake's value as habitat for aquatic organisms;
- 6) A discussion of how the DFO's *Principle of No Net Loss* will be considered during the YGP's operation;
- 7) The potential effects that road development, including water crossings, will have on aquatic organisms and habitat; and

- 8) The potential effects that YGP operations may have in increasing contaminant concentrations in fish.

I-3 Vegetation

Preamble: *Discussions held during the scoping sessions concerning the potential effects of the YGP on vegetation was minimal. The majority of the discussion on this component was related to species that may be employed in site reclamation activities. Those concerns are addressed in Section J – Abandonment and Reclamation.*

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to:

- 1) An assessment on the potential effects of the YGP on rare plant communities, particularly *Species at Risk Act*-listed species, if applicable, in areas potentially affected by the Development;
- 2) The potential effects of YGP operations on culturally significant species – as identified through traditional or community knowledge;
- 3) The potential effects of vehicle, mill and power plant emissions on vegetation;
- 4) The potential effects of dust emissions on vegetation; and
- 5) A conceptual plan for the adaptive management of effects on vegetation, including any monitoring programs, as well as reporting to regulators and potentially-impacted communities.

I-4 Wildlife and Wildlife Habitat

Preamble: *Concern over potential adverse impacts to wildlife and wildlife habitat were noted in the scoping sessions. Specific concerns were related to effects on wildlife from development of high value wildlife habitat such as eskers. The development of a wildlife management plan that is applicable to a wide range of species was also identified as being needed.*

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to:

- 1) The rationale and methodology for the selection of species as Valued Components (VCs);
- 2) The effects that each YGP component may have on wildlife and wildlife habitat VCs, which shall include, but not be limited to:
 - a. Potential direct effects to habitat with a quantification of that effect, “per Valued Component”;
 - b. Potential indirect effects to habitat with a quantification of that loss, “per Valued

Component”;

- c. Historic, current and expected wildlife use of potentially-contaminated water sources, and an assessment of the effects predicted from such activity;
 - d. Potential effects to VCs from vehicle traffic, including YGP related travel on the Winter Road;
 - e. Potential effects of dusting, originating from YGP operations, on wildlife habitat;
 - f. Potential effects of odour and noise on wildlife;
 - g. Physical barriers to wildlife erected as a result of the construction;
 - h. Disruption, blockage, impediment and sensory disturbance, of daily or seasonal wildlife movements (e.g., migration, home ranges); and
 - i. A discussion as to how site planning for the mine has considered potential effects on wildlife and wildlife habitat; this should include minimizing potentially high use areas such as eskers.
- 3) The potential effects of YGP operations on rare, threatened or endangered species including *Species at Risk Act*- listed species as pursuant to Section 79 of the *Species at Risk Act*, as well as consideration to species listed by the *Committee on the Status of Endangered Wildlife in Canada* and the *General Status Ranks of Wild Species in the NWT*;
 - 4) The potential effects of YGP operations in attracting wildlife and discussion as to how Tyhee intends to manage wildlife access on the mine site, with particular emphasis on the Tailings Containment Area, waste rock and ore stockpiles, and transportation routes;
 - 5) A conceptual wildlife management plan, including furbearers, migratory birds, waterfowl, large ruminants and large carnivores, in regards to activities occurring at the mine site and in the transportation corridor, including but not limited to:
 - a. Efforts to be undertaken to monitor wildlife in the vicinity of the YGP;
 - b. Identification of adaptive management measures to avoid, minimize, and mitigate potential effects to wildlife when detected through wildlife monitoring; and
 - c. How monitoring results and mitigation efforts will be reported to regulators and potentially-affected communities.

I-5 Terrain

Preamble: *The scoping sessions noted concerns about use of the Discovery Mine airstrip and its susceptibility to degradation. Expansion of the winter road beyond its current alignment was identified as a concern, as were potential impacts to the permafrost.*

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to:

- 1) The potential effects of all YGP operations on the terrain which shall include, but not be limited to:
 - a. Buildings and mining support infrastructure;
 - b. The complete road network;
 - c. The Tailings Containment Area and associated infrastructure;
 - d. The proposed airstrip, particularly in regards to the long term and increased use of the Discovery Mine airstrip;
 - e. Aggregate extraction; and
 - f. Any envisioned expansions to the winter road as may be required for the YGP beyond the existing scope of the current winter road.
- 2) The potential effect of YGP operations on terrain due to potentially increased sedimentation and erosion;
- 3) The potential impact of YGP operations on land subsidence in the area of the Ormsby Zone and Nicholas Lake mine workings;
- 4) A discussion of Tyhee's commitment to minimize the overall footprint of the mine, as well as its consideration for locating its infrastructure on brownfields⁵ sites;
- 5) The potential effects of YGP operations on permafrost conditions in the mining area; and
- 6) An adaptive management plan to monitor and mitigate against adverse effects on local terrain, including:
 - a. A conceptual outline of the quarry management plan;
 - b. A conceptual outline of the waste management plan;
 - c. A conceptual outline of the geotechnical monitoring plan; and
 - d. A discussion of how monitoring results will be reported to regulators and potentially-affected communities.

I-6 Air Quality and Climate

Preamble: *It is acknowledged that in the Northwest Territories there is presently no enforceable regulatory regime for air quality. In the scoping sessions, it was noted that Tyhee has suggested a*

⁵ Brownfield land is an area of land previously used or built upon, as opposed to greenfield land which has never been built upon

commitment to meet the Guideline for Ambient Air Quality Standards in the Northwest Territories and GNWT Guideline for Dust Suppression, as well as other possible guidelines. However, significant adverse impacts to air quality may still occur despite the adherence to the aforementioned guidelines. It is the purpose of the EA and the task of the Review Board to assess the YGP's potential impacts to air quality.

While conducting an impact assessment based on identified valued components, specific consideration shall be given to, but not be limited to:

- 1) A discussion of the standards, guidelines and regulations that will be applied to the YGP operation in all areas related to air quality;
- 2) A discussion of the technology that will be utilized in YGP operations to ensure that significant adverse impacts to air quality are not incurred;
- 3) The potential effects of YGP operations on air quality through the atmospheric dispersion of emissions and dust on a local and regional scale. This shall include, but not be limited to estimates of:
 - a. Emissions from waste incinerator(s), with particular emphasis on the generation of dioxins, furans and mercury;
 - b. Dust from roads, waste rock and ore stockpiles, tailings containment areas, quarries, and mill activities;
 - c. Emissions from the gold refinery; and
 - d. Emissions from vehicles and diesel generators.
- 4) A discussion of YGP operations as a potential source of acidic precipitation, identification of those effects, and evaluation of the potential effects;
- 5) A discussion of the potential effect of YGP operations in generating greenhouse gas emissions, which shall include but not be limited to the following:
 - a. Predicted total annual atmospheric loading of greenhouse gases in CO₂ equivalent values;
 - b. Comparison of the value determined in a) to the total emission generated in NWT, as well as Canada as a whole; and
 - c. A discussion of Tyhee's consideration to minimize greenhouse gas emissions.
- 6) A conceptual outline of the air quality adaptive management plan, which shall include a discussion of any proposed monitoring programs, as well as how monitoring results will be reported to regulators and impacted communities.

I-7 Biophysical Environmental Monitoring

- 1) Report on any discussions with communities, federal and territorial governments related to negotiating collaborative arrangements to manage, monitor and mitigate the project as a whole, as well as individual project components (i.e. Discovery airstrip). Include a discussion of Tyhee's general approach toward negotiating arrangements such as environmental agreements.

J Closure and Reclamation

Preamble: *Closure and Reclamation issues were noted on a number of occasions in the scoping sessions. Although Closure and Reclamation is normally dealt with in detail at the regulatory phase of a development, public concern around this issue demands that it be considered in an appropriate and substantial manner for this EA.*

The following items are required for consideration of this environmental component:

- 1) A description of the policies, regulations and industry standards that will be considered in the development of the Closure and Reclamation plan;
- 2) A conceptual Closure and Reclamation Plan for the purpose of this environmental assessment, which shall include, but not be limited to:
 - a. A list of Closure and Reclamation components and activities;
 - b. A consideration of various reclamation scenarios for the site;
 - c. The rationale for the selection of proposed activities versus alternatives that have been dismissed;
 - d. Conceptual outline of details of the methods and location for on- and off-site disposal of materials;
 - e. A visual depiction of the site at the completion of mine reclamation based upon the current development description;
 - f. A cost-estimate component of proposed reclamation activities;
 - g. A conceptual post-closure monitoring plan, for protection of both the biophysical and human environment, which should also include a discussion of how monitoring results will be reported to regulators and potentially-impacted communities; and
 - h. Discussion concerning Tyhee's liabilities for the Tailings Containment Area, airstrip, quarries, and the Discovery project areas for remediated infrastructure at these sites and financial security associated with these and other items.

- 3) A discussion concerning the adequacy of the Tailings Containment Area closure design to prevent acid rock drainage, with respect to providing a sufficient barrier for the prevention of tailings oxidation, the re-suspension of tailings due to wave action, movement of groundwater through the tailings masses or any other major pathway;
- 4) A discussion concerning the management and monitoring program for waste rock, overburden or other material that could potentially cause an acid rock drainage effect;
- 5) The potential social and economic effects of the mine closure;
- 6) A discussion regarding Tyhee's approach to working with potentially-affected local communities and aboriginal groups to ensure that public values are taken into consideration during Closure and Reclamation; and
- 7) A discussion concerning the feasibility of establishing a self-sustaining vegetation community on the mine site after closure, if re-vegetation is to be considered, which shall include but not be limited to the following:
 - a. Proposed re-vegetation techniques including a discussion on what species will be considered for this activity; and
 - b. Predicted vegetation re-growth rates.

K Cumulative Effects

Preamble: Pursuant to Section 117(2)(a) of the MVRMA, the Review Board considers cumulative effects in its determination. During the scoping sessions, three major cumulative effects concerns were identified:

- Cumulative biophysical effects on water quality in the Yellowknife River system;
- Cumulative social, economic and cultural effects associated with the increasing number of operating mines in the Mackenzie Valley and other areas of the Slave Geological Province, and the ability to maximize benefits remaining in the North; and
- Cumulative biophysical effects from historic and current industrial development on the immediate Discovery Mine and Yellowknife Gold Project areas. In particular, the effects of the continued use of the Discovery Mine airstrip, as well as effects to the water resources (i.e Round and Giauque Lakes) shared between the two sites, and the implications of such effects on the YGP.

In addressing this section, Tyhee is strongly encouraged to refer to Appendix H of the Review Board's Environmental Impact Assessment Guidelines.

The following items are required for consideration of cumulative effects:

- 1) An analysis; of the Valued Components (VCs) to be considered in the cumulative effects assessment.

- 2) Determination of the other past, present and reasonably foreseeable human activities that may affect the same VCs, which should include:
 - a. A discussion of developments considered, but not included and the rationale for that decision; and
 - b. The rationale for including the developments considered in a).
- 3) Identification and rationale for the geographic and temporal scale that will be applied to the cumulative effects assessment of the VCs under consideration;
- 4) Discussion of the approach and methodologies used to identify and assess cumulative effects. This shall include the provision of explicit documentation of the assumptions, models and information sources used, as well as information limitations and associated levels of uncertainty;
- 5) Cumulative effects predictions, which consider, but are not limited to the following:
 - a. Potential effects to the VCs likely to result from the proposed development in combination with past, present or reasonably foreseeable developments; and
 - b. The delineation of effects to the biophysical environment which are attributable to either the Discovery Mine or the YGP.
- 6) A plan for the monitoring of cumulative effects and the adaptive management of the YGP's contribution to regional cumulative effects.

L Accidents and Malfunctions

Preamble: Pursuant to Section 117(2)(a) of the MVRMA, the Review Board considers the potential effects of malfunctions or accidents that may occur in connection with the Development. While details concerning emergency response plans are normally reviewed in detail at the regulatory phase of a development, certain details concerning accidents and malfunctions must be provided in this EA.

The following items are required for consideration of accidents and malfunctions:

- 1) A discussion regarding company policies, industry standards, guidelines or regulations to be considered in the planning and operation of the YGP.
- 2) Predict the risks and effects of accidents and malfunctions, with particular consideration to a failure of the tailings containment area; major fuel spills at the YGP site or along transportation routes; accidents involving the transportation and handling of cyanide containing compounds.
- 3) Discuss emergency response measures, that shall include, but not be limited to the following:

- a. Storage, transportation and handling system failures of hydrocarbons;
 - b. Storage, transportation and handling system failures of explosives;
 - c. Storage, transportation and handling system failures of cyanide and other hazardous process chemicals;
 - d. Storage, transportation and handling system failures of any other hazardous compounds to be used at the YGP;
 - e. Failures of the Tailings Containment Area, including worst case scenarios such as catastrophic failure of the dyke, as well as tailings spills;
 - f. Responses to vehicle and industrial accidents;
 - g. Provision of a copy of the contractor's fuel handling and spill clean-up procedures, and an explanation of how the proponent has ensured that the contractors is cognizant of, and in adherence to, permit conditions; and
 - h. A description of the measures to be used to prevent, prepare for, respond to and recover from, any accident or malfunctions identified in the environmental emergency response plans should be included. Spill contingency plans should include locations of disposal sites approved to accept wastes and means of storage prior to disposal.
- 4) A discussion as to how Tyhee will prevent or reduce malfunctions associated with activities conducted by its contractors, with particular consideration to use of the winter road;
 - 5) A discussion as to how site planning and engineering considerations have been undertaken to prevent or reduce the likelihood of malfunctions and accidents during YGP operations; and
 - 6) A discussion concerning adaptive management measures in the event that Tyhee is unable to meet water quality parameters at the point of discharge (as per *Metal Mine Effluent Regulations* or Water Licence parameters).

5 Assessment Process

Section Three of the MVEIRB Environmental Impact Assessment Guidelines describes the Environmental Assessment process in detail. This section will describe roles, milestones, deliverables and timing for this assessment.

5.1 Responsibilities

The roles and responsibilities of the Review Board and its staff, government bodies, Tyhee and other parties in the EA are explained in this section. Further information regarding the structure of the EA process is available in the Review Board's *Environmental Impact Assessment Guidelines* and the *Rules of Procedures*.

All submissions received from all sources will be considered during the Review Board's decision-making. Usually such submissions will be public documents and will be posted on the Public Registry. However, the Review Board may accept documents on a confidential basis if required. Submissions should be in a format that is easily available to all stakeholders and should follow any templates provided by the Review Board.

Review Board

The Review Board, assisted by its staff, is required to undertake the following in relation to this EA:

- Conduct the EA in accordance with Section 26(3) of the *MVRMA*;
- Take into account any previous screening or assessment report made in relation to the development, in accordance with Section 127 of the *MVRMA*;
- Determine the Scope of Development, in accordance with Section 117(1) of the *MVRMA*;
- Consider EA factors, in accordance with Section 17(2) of the *MVRMA*;
- Make a determination regarding the environmental impacts and public concern of the development, in accordance with Section 128(1) of the *MVRMA*;
- Identify areas and extent of impacts in or outside the Mackenzie Valley in which the development is likely to have a significant adverse impact or be a cause of significant public concern, in accordance with Section 128(4) of the *MVRMA*;
- Report to the Federal Minister in accordance with Section 128(2) of the *MVRMA*.

The Review Board's Environmental Assessment Officer (EAO) is the primary point of contact between the Review Board and the developer, government bodies (federal, territorial and municipal), non-government organizations (NGOs), first nations, expert advisors (expert consultants contracted directly by the Review Board), the public and other interested parties. This does not limit or preclude the developer's contact with other parties during the EA process.

This Environmental Assessment will be principally coordinated and facilitated by Patrick Duxbury, Environmental Assessment Officer.

Government Bodies

Government bodies may be involved in the EA process as:

- A Regulatory Authority as defined in the *MVRMA*;
- A Responsible Minister as defined in the *MVRMA*;
- A Federal Minister as defined in the *MVRMA*; or
- Advisor to the Review Board.

Developer

Tyhee is expected to respond in a suitable and timely manner to directions and requests issued by the Review Board. Tyhee may present additional information at any time to the Review Board beyond what was requested during the EA process. The Review Board encourages Tyhee to continue consulting all potentially-impacted communities and organizations throughout the EA process.

Other Parties

First Nations, aboriginal groups, NGOs, the public and other interested parties may request and be granted party standing by the Review Board, as per the *MVEIRB Rules of Procedure*. Parties may provide the Review Board with information relevant to the EA of their own volition, or they may be asked by the Review Board to provide any relevant information they may have. Parties are expected to participate and respond to directions and requests issued by the Review Board in a suitable and timely manner.

In addition to the expertise available from parties, the Review Board may also choose to hire expert advisors to provide technical expertise on specific aspects of the EA.

5.2 Milestones

Table I summarizes the milestones and responsibilities in the EA process.

Table I - Milestones + Responsibilities in the EA Process

Milestone	Developer	Government Bodies	Other Parties	Review Board and Staff
EA start-up				✓
Scoping Sessions	✓	✓	✓	✓
Draft Terms of Reference and Work Plan				✓
Review and comment on draft ToR and WP	✓	✓	✓	
Final ToR and WP				✓
Developer's Assessment Report	✓			
Conformity Check and Deficiency Statement (if required)				✓
Deficiency Statement Response	✓			
Information Requests (if required)		✓	✓	✓
Information Request Responses or Roundtable technical meeting (if required)	✓	✓	✓	✓
Technical Analysis		✓	✓	✓
Public/Community Hearing (at Board's discretion)	✓	✓	✓	✓
Review Board Report of EA and Reasons for Decision				✓
Response from the Minister of Indian Affairs and Northern Development (if required)		✓		
Consultation - throughout / as required	✓	✓	✓	✓

5.3 Deliverables

The following section lists and explains the various deliverables to be produced during the EA process. They are listed in the order they will be produced.

Public Registry, public notification, government notification, developer notification, expert advisor identification, identification of EA roles

The Review Board has initiated the notification measures required by the MVRMA. The Review Board has opened the Public Registry on the EA. The Public Registry will be updated regularly. The Review Board will identify expert advisors if and as required. Please refer to Section 3.7 of the *Environmental Impact Assessment Guidelines* for further detail.

Approved Terms of Reference and Work Plan

A final Terms of Reference and Work Plan will be developed by incorporating written comments on the draft document received from parties, as well as comments and conclusions drawn from the issues scoping session. This document will contain the scope of the development, the scope of the assessment, directions to the developer, a description of the EA process and an EA schedule. Please refer to Section 3.10 of the *Environmental Impact Assessment Guidelines* for further information.

Developer's Assessment Report

Tyhee will be responsible for submitting to the Review Board a DAR that will provide the information listed in Section 4 of these Terms of Reference. Tyhee should use diagrams, charts and maps for clarifying information presented in the text where appropriate and should consider the use of a glossary for technical or uncommon terms.

Conformity Check, Review Board Deficiency Statement and Developer's Response

The Review Board will review the DAR to ensure that Tyhee has provided the information required. If needed, the Review Board will issue a deficiency statement identifying those areas in which Tyhee has not provided sufficient information to address an item listed in the Terms of Reference. Tyhee will be asked to submit information to the Review Board to fill the information gaps identified by the deficiency statement. If the Review Board is not satisfied with the information received, it will halt the EA until it has received an adequate response. Please refer to Section 3.12 of the *Environmental Impact Assessment Guidelines* for details.

Information Requests and Responses to Information Requests

Information Requests (IRs) are very specific and focused requests for clarification or additional information. They may be required for the Review Board to complete its analysis and reach a conclusion about the information provided by Tyhee. The first round of IRs issued will be developed by the Review Board. The second round will be open to all EA participants.

IRs can be issued by any party in the EA and can be directed to any other party. However, all IRs must be submitted to the Review Board for approval and they must also be submitted in the form required by the Review Board. If approved, the Review Board will then issue the IR under its authority to the intended IR recipient. The IRs and the responses will be included in the Public Registry and be used as evidence for the consideration of the Review Board. See Section 3.14 of the *Environmental Impact Assessment Guidelines* for details.

Roundtable Technical Meeting(s) Report

The Review Board, in lieu of, or in addition to the above-mentioned IR process, may choose to hold a roundtable technical meeting to permit a face-to-face question and answer sessions between interested parties, Tyhee and Review Board staff. In advance of a roundtable technical meeting, parties will submit their questions/comments to Tyhee, or to other parties, by way of the Review Board, to allow Tyhee or parties sufficient time to develop a response. To ensure a fair process, the Review Board exercises discretionary control over what issues may be brought forward in the meeting. Review Board staff will ensure that a record of the meeting is made. Following the meeting, the Review Board will issue a report that details the nature of the proceedings and any technical issues that were identified, discussed, resolved or left outstanding.

Technical Reports from EA parties

The Review Board staff will undertake the analysis of the EA with the assistance of federal and territorial governments, aboriginal groups, the public, and other interested parties. A thorough analysis of the YGP is essential to assist the Review Board to make the best EA decision. This is a critical stage in the EA process where the key issues and impacts are identified and evaluated. Tyhee can formally provide and present its views on the information brought to the Review Board's attention including any proposed amendments, additions or refinements to the development or the environmental assessment documents. The technical reports from EA parties are to clearly state the reviewer's conclusions, recommendations and supporting rationales. See Section 3.13 of the *Environmental Impact Assessment Guidelines* for details.

Review Board's Report of Environmental Assessment (EA Decision)

The Review Board will provide the Minister of Indian and Northern Affairs Canada (INAC) with its Report of Environmental Assessment as per Section 128(2) of the MVRMA. The Minister of INAC will distribute the report to every responsible minister as per Section 128(2)(a) of the MVRMA. The developer and the other EA parties will also receive copies of the Review Board's Report of EA. See Section 3.16 of the *Environmental Impact Assessment Guidelines* for details.

5.4 Schedule

Table 2 provides **estimated** time lines for the completion of each milestone in the EA. Days refer to working days, not calendar days. The Review Board may amend the schedule at its discretion.

Table 2 - EA Schedule

MILESTONE	Duration
Terms of Reference and Work Plan	
Referral and start-up of the EA	3 days
Scoping Sessions and preparing draft Terms of Reference and Work Plan	48 days
Comments on draft ToR and WP	10 days
Final Terms of Reference and Work Plan	7 days
Developer's Assessment Report	90 days
Review Board Conformity Check and Deficiency Statement (if required)	10 days
Developer's response to the Deficiency Statement (if required)	15 days
Review Board IRs to developer or parties	12 days
Developer's response and preparation of Roundtable technical meetings and questions by Review Board and parties	20 days
Roundtable technical meetings	3 days
Open Round of IRs	15 days
Parties' technical reports	15 days
Pre-hearing conference	1 day
Preparation for Public or Community Hearing(s)	5 days
Conduct of Public or Community Hearing(s)	5 days
Closure of Public Registry	2 days
Additional Board IRs (if required)	---
Review Board EA decision	50 days
Review Board's Report of EA to the Minister of INAC	1 day
Federal Minister's response to the Review Board's Report of EA	---

